KT11-C

KEYS
MD-11-DCKTC-A

EP-DCKTC-A-DL-A

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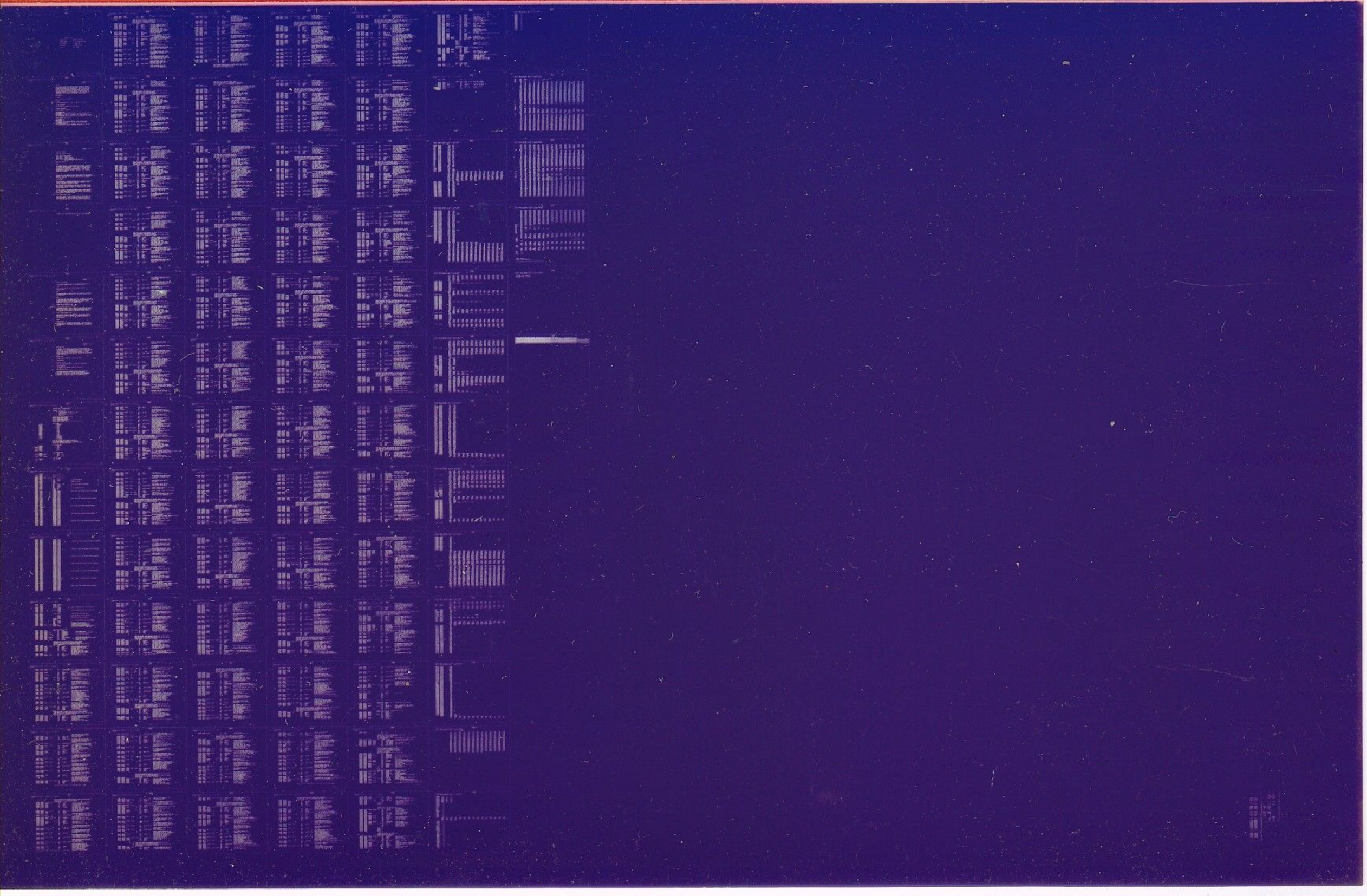

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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DCKTC-A
PRODUCT NAME:	KT11-C ACCESS KEYS TEST
DATE CREATED:	15 APRIL 1972
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	RICK FADDEN

1.0 ABSTRACT

THIS PROGRAM CHECKS THE OPERATION OF EACH ACCESS KEY FOR EACH OF THE FOUR UNIBUS CYCLES (OR COMBINATION OF CYCLES) WHICH MAY REFERENCE AN ADDRESS THRU SEGMENTATION. THESE CYCLES ARE DATI, DATO (NO DATIP), DATIP-DATO, AND DATIP-DATOB. EACH OF THESE CASES IS TESTED WITH AND WITHOUT MEMORY MANAGEMENT ENABLE SET. THUS EIGHT CASES ARE TESTED FOR EACH KEY. SR0, SR1, SR2, THE CORRESPONDING PDR'S, AND THE PROPER EXECUTION OR PREVENTION OF EXECUTION OF THE INSTRUCTION ARE CHECKED IN EACH CASE.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP 11/45 WITH KT11-C OPTION

2.2 STORAGE

THE PROGRAM REQUIRES 5K OF MEMORY, STARTING AT LOCATION 0.

3.0 LOADING PROCEDURE

LOAD PROGRAM INTO MEMORY USING ABS LOADER.

4.0 STARTING PROCEDURE

4.1 NORMAL DIAGNOSTIC OPERATION

LOAD ADDRESS 200.
SET DESIRED SWITCH REGISTER SETTINGS (ALL DOWN FOR WORST CASE).
PRESS START.
THE PROGRAM WILL DISPLAY THE NUMBER OF THE CURRENT SUBTEST IN THE DISPLAY REGISTER, AND WILL RING THE BELL ON COMPLETION OF A PASS.

4.2 SINGLE SUBTEST LOOP (TESTX)

LOAD ADDRESS 210.
PRESS START.
AT THE FIRST HALT, LOAD THE ADDRESS OF THE DESIRED SUBTEST (THE ADDRESS OF THE TESTXX TAG) INTO THE SWITCH REGISTER.
THEN PRESS "CONTINUE".
AT THE SECOND HALT, SET THE OPERATONAL SWITCH SETTINGS DESIRED (SW11 MUST BE SET TO ZERO). THEN PRESS CONTINUE.

5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW15=1 OR UP-- HALT ON ERROR
SW14=1 OR UP-- SCOPE LOOP
SW13=1 OR UP-- INHIBIT PRINTOUT
SW11=1 OR UP-- INHIBIT ITERATIONS
SW08=1 OR UP-- LOAD MICROBREAK REGISTER WITH VALUE IN
SW00-SW07(AT START OF TEST ONLY).

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST. IT RECORDS THE STARTING ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED. IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE START OF THE SUBTEST THAT THE SCOPE LOOP IS REQUESTED FOR. IF SCOPE LOOP IS NOT REQUESTED, THERE WILL BE 1024 ITERATIONS ON THAT SUBTEST BEFORE THE NEXT SUBTEST IS ENTERED. SWITCH 11 ON A 1 INHIBITS ITERATION OF SUBTESTS.

5.2.2 HLT

THIS EMT CALLS THE SUBROUTINE PRINT, WHICH PRINTS OUT THE LOCATION COUNTER AT THE TIME OF FAILURE AND THE CONTENTS OF THE PROCESSOR STATUS REGISTER. NOTE THAT THE LOCATION COUNTER WILL BE THE ADDRESS OF THE HLT PLUS TWO.

5.2.3 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS STARTING AT LOCATION 0 DESIGNED TO DETECT AND ISOLATE UNEXPECTED TRAPS AND INTERRUPTS TO THE TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

EACH VECTOR ENTRANCE ADDRESS IS LOADED WITH THE ADDRESS OF THE NEXT LOCATION. THE NEXT LOCATION IS LOADED WITH A HALT (000000). THUS AN ILLEGAL TRAP OR INTERRUPT WILL CAUSE A HALT AT THE TRAP LOCATION PLUS TWO.

IF A HALT OCCURS IN THE TRAP OR INTERRUPT AREA, EXAMINE REGISTER SIX. IT WILL CONTAIN THE CURRENT STACK ADDRESS. THE CONTENTS OF THE CURRENT STACK ADDRESS IS THE VALUE OF THE LOCATION COUNTER WHEN THE TRAP OF INTERRUPT OCCURRED.

5.2.4 TESTX (SINGLE SUBTEST LOOP)

THIS ROUTINE ALLOWS A SINGLE SUBTEST TO BE RUN CONTINUOUSLY FOR SCOPE LOOP PURPOSES. WHILE A SCOPE LOOP SWITCH OPTION EXISTS, IT REQUIRES THAT YOU ARE WITHIN THE TEST IN WHICH YOU WISH TO LOOP. IN SOME CASES (SUCH AS WITH INTERMITTENT FAILURES) THAT'S

NOT EASY TO DO. THIS SUBROUTINE ALLOWS YOU TO LOAD THE ADDRESS
OF ANY SUBTEST AT THE HALT AND THEN GO DIRECTLY TO THAT TEST.

5.2.5 EMTSRV (EMT DECODER)

THIS ROUTINE DECODES ALL EMT CALLS, INCLUDING PATCHES AND THE HLT CALL WHICH PASSES CONTROL TO THE PRINT ROUTINE.

5.2.6 CLRALL

THIS ROUTINE CLEARS ALL THE PAR'S AND PDR'S OF THE KTII-C, AS WELL AS SRO.

5.2.7 RWALL

THIS ROUTINE MAPS ALL PAGES TO BANK 0 BY CLEARING ALL THE PAR'S. ALL PAGES ARE MADE 4K READ-WRITE BY LOADING ALL THE PDR'S WITH THE VALUE 77406.

5.2.8 SETUP

THIS ROUTINE FIRST CALLS RWALL TO MAP ALL THE PAGES 4K, RW, BANK 0. IT THEN SETS THE KEY FOR KERNEL PAGE 1 TO WHATEVER VALUE WAS STORED ON THE STACK BEFORE THE ROUTINE WAS CALLED. THIS ALLOWS A REFERENCE TO PAGE 1 TO TEST THE DESIRED ACCESS KEY. FINALLY, KERNEL PAGE 7 IS MAPPED TO THE EXTERNAL BANK.

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 SA 200 (NORMAL DIAGNOSTIC OPERATION)

THE PROGRAM EXECUTES 8 TESTS OF EACH KEY, DISPLAYING THE SUBTEST NUMBER IN THE LIGHTS. TESTS 21 THRU 30 ARE CYCLED THRU 3 TIMES, ONCE FOR EACH OF THE KEYS WHICH GIVES A NON-RESIDENT ABORT. AT THE END OF EACH PASS THRU THE DIAGNOSTIC THE BELL IS RUNG.

5.3.2 SA 210 (SINGLE SUBTEST LOOP)

THIS STARTING ADDRESS ALLOWS THE USER TO RUN A SINGLE SUBTEST REPEATEDLY BY GIVING THE ADDRESS OF THE DESIRED SUBTEST AT THE FIRST HALT. IF SW11 IS SET TO A ONE, NORMAL TEST EXECUTION WILL BE RESUMED.

6.0 ERRORS

6.1 ERROR PRINTOUT

PRINTOUTS ARE IN A STANDARD TWO-WORD FORMAT. THE FIRST WORD IS THE OCTAL VALUE OF THE PC+2 OF THE DETECTED ERROR. THE SECOND IS THE CONTENTS OF THE PROCESSOR STATUS REGISTER WHEN THE ERROR WAS DETECTED.

6.2 ERROR RECOVERY

IN GENERAL, TEST FAILURES WILL PRINTOUT AN ERROR MESSAGE AND CONTINUE. IF THE "HALT ON ERROR" SWITCH IS SET, HITTING CONTINUE WILL RECOVER. IF THE PROGRAM HANGS UP IN A LOOP, THE ERROR IS LIKELY TO BE A SIGNAL WHICH WAS NEVER RECEIVED. IF A HALT OCCURS IN THE TRAP AND VECTOR AREA THE PROGRAM MUST BE RESTARTED. IF THE PROGRAM HALTS IN THE MAIN FLOW, CONSULT THE LISTING IF NO MESSAGE IS TYPED OUT.

7.0 RESTRICTIONS

PROGRAM MUST BE LOADED INTO LOWER 5K OF MEMORY.

8.0 MISCELLANEOUS

8.1 EXECUTION TIME

EACH PASS TAKES APPROXIMATELY 1 MINUTE WITH CORE MEMORY.

8.2 DISPLAY REGISTER

THE NUMBER OF THE CURRENT SUBTEST IS DISPLAYED.

9.0 PROGRAM DESCRIPTION

THE PROGRAM RUNS EIGHT SEPARATE TESTS OF EACH ACCESS KEY. DATI, DATO (NO DATIP), DATIP-DATO, AND DATIP-DATOB ARE CHECKED FOR EACH KEY, WITH AND WITHOUT MEMORY MANAGEMENT ENABLE SET. THE SUBTEST NUMBER IS DISPLAYED IN THE DISPLAY REGISTER, AND THE BELL IS RUNG AT THE END OF EACH PASS.

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                                ;COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                                ;TEST OF THE KT11-C ACCESS KEYS

                                ;OPERATING INSTRUCTIONS
                                ;       1.  LOAD TEST USING THE ABSOLUTE LOADER
                                ;       2.  LOAD SA 200
                                ;       3.  SET SR TO INITIAL SETTINGS
                                ;       4.  PRESS START

                                ;DYNAMIC SWITCH REGISTER SETTINGS ARE:
                                ;SW15=1 CAUSES HALT ON ERROR
                                ;SW14=1 CAUSES SCOPE LOOPING
                                ;SW13=1 INHIBITS ERROR PRINTOUT
                                ;SW11=1 INHIBITS ITERATIONS
                                ;SW08=1 LOAD MICROBREAK REGISTER WITH LOW BYTE OF SR

                                ;DEFINITIONS
104400                                  SCOPE=TRAP
000240                                  NOP=240
000000                                  R0=%0
000001                                  R1=%1
000002                                  R2=%2
000003                                  R3=%3
000004                                  R4=%4
000005                                  R5=%5
000006                                  R6=%6
000007                                  R7=%7
000006                                  SP=%6
000007                                  PC=%7
177570                                  SR=177570
177776                                  PS=177776
177776                                  STATUS=PS
104006                                  HLT=104006

                                ;LOAD TRAP CATCHER IN LOCATIONS 0 THRU 377
                                ;EACH VECTOR ADDRESS IS LOADED WITH THE ADDRESS
                                ;OF THE NEXT LOCATION, AND THE NEXT LOCATION IS LOADED
                                ;WITH A HALT INSTRUCTION (000000)

                                ;LOAD VECTOR AREA
        000030                          .=30
000030  023224                          EMTSRV
000032  000340                          340
        000034                          .=34
000034  022472                          SCOPEC
000036  000000                          0

                                ;LOAD STARTING AREA
        000200                          .=200
000200  000167  003210                  JMP     START
        000210                          .=210
000210  000167  022146                  JMP     TESTX

                                ;LOAD DATA AREA
        001000                          .=1000
001000  000000                  KSTACK: 0
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                002000                          .=.+776
002000          000000          SSTACK: 0
                003000                          .=.+776
003000          000000          USTACK: 0
003002          000000  000000  000000          .WORD 0,0,0,0
003010          000000
003012          177564          TCSR:   177564          ;TELETYPE PRINTER CSR
003014          177566          TDBR:   177566
003016          000000          TEMPX:  0               ;TEMPORARY STORAGE
003020          000000          TEMP1:  0
003022          000000          TEMP2:  0
003024          177572          SR0:    177572          ;KT11-C STATUS REGISTER ADDRESSES
003026          177574          SR1:    177574
003030          177576          SR2:    177576
003032          172516          SR3:    172516
003034          000250          KTVEC:  250             ;KT11-C INTERRUPT VECTOR
003036          000252          KTSTA:  252
003040                          ADRTAB:
003040          177600          UIPDR0: 177600          ;USER I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003042          177602          UIPDR1: 177602
003044          177604          UIPDR2: 177604
003046          177606          UIPDR3: 177606
003050          177610          UIPDR4: 177610
003052          177612          UIPDR5: 177612
003054          177614          UIPDR6: 177614
003056          177616          UIPDR7: 177616
003060          177620          UDPDR0: 177620          ;USER D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003062          177622          UDPDR1: 177622
003064          177624          UDPDR2: 177624
003066          177626          UDPDR3: 177626
003070          177630          UDPDR4: 177630
003072          177632          UDPDR5: 177632
003074          177634          UDPDR6: 177634
003076          177636          UDPDR7: 177636
003100          177640          UIPAR0: 177640          ;USER I-SPACE PAGE ADDRESS REGISTER ADDRESSES
003102          177642          UIPAR1: 177642
003104          177644          UIPAR2: 177644
003106          177646          UIPAR3: 177646
003110          177650          UIPAR4: 177650
003112          177652          UIPAR5: 177652
003114          177654          UIPAR6: 177654
003116          177656          UIPAR7: 177656
003120          177660          UDPAR0: 177660          ;USER D-SPACE PAGE ADDRESS REGISTER ADDRESSES
003122          177662          UDPAR1: 177662
003124          177664          UDPAR2: 177664
003126          177666          UDPAR3: 177666
003130          177670          UDPAR4: 177670
003132          177672          UDPAR5: 177672
003134          177674          UDPAR6: 177674
003136          177676          UDPAR7: 177676
003140          172200          SIPDR0: 172200          ;SUPERVISOR I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003142          172202          SIPDR1: 172202
003144          172204          SIPDR2: 172204
003146          172206          SIPDR3: 172206
003150          172210          SIPDR4: 172210
003152          172212          SIPDR5: 172212
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003154  172214                  SIPDR6: 172214
003156  172216                  SIPDR7: 172216
003160  172220                  SDPDR0: 172220          ;SUPERVISOR D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003162  172222                  SDPDR1: 172222
003164  172224                  SDPDR2: 172224
003166  172226                  SDPDR3: 172226
003170  172230                  SDPDR4: 172230
003172  172232                  SDPDR5: 172232
003174  172234                  SDPDR6: 172234
003176  172236                  SDPDR7: 172236
003200  172240                  SIPAR0: 172240          ;SUPERVISOR I-SPACE PAGE ADDRESS REGISTER ADDRESSES
003202  172242                  SIPAR1: 172242
003204  172244                  SIPAR2: 172244
003206  172246                  SIPAR3: 172246
003210  172250                  SIPAR4: 172250
003212  172252                  SIPAR5: 172252
003214  172254                  SIPAR6: 172254
003216  172256                  SIPAR7: 172256
003220  172260                  SDPAR0: 172260          ;SUPERVISOR D-SPACE PAGE ADDRESS REGISTER ADDRESSES
003222  172262                  SDPAR1: 172262
003224  172264                  SDPAR2: 172264
003226  172266                  SDPAR3: 172266
003230  172270                  SDPAR4: 172270
003232  172272                  SDPAR5: 172272
003234  172274                  SDPAR6: 172274
003236  172276                  SDPAR7: 172276
003240  172300                  KIPDR0: 172300          ;KERNEL I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003242  172302                  KIPDR1: 172302
003244  172304                  KIPDR2: 172304
003246  172306                  KIPDR3: 172306
003250  172310                  KIPDR4: 172310
003252  172312                  KIPDR5: 172312
003254  172314                  KIPDR6: 172314
003256  172316                  KIPDR7: 172316
003260  172320                  KDPDR0: 172320          ;KERNEL D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003262  172322                  KDPDR1: 172322
003264  172324                  KDPDR2: 172324
003266  172326                  KDPDR3: 172326
003270  172330                  KDPDR4: 172330
003272  172332                  KDPDR5: 172332
003274  172334                  KDPDR6: 172334
003276  172336                  KDPDR7: 172336
003300  172340                  KIPAR0: 172340          ;KERNEL I-SPACE PAGE ADDRESS REGISTER ADDRESSES
003302  172342                  KIPAR1: 172342
003304  172344                  KIPAR2: 172344
003306  172346                  KIPAR3: 172346
003310  172350                  KIPAR4: 172350
003312  172352                  KIPAR5: 172352
003314  172354                  KIPAR6: 172354
003316  172356                  KIPAR7: 172356
003320  172360                  KDPAR0: 172360          ;KERNEL D-SPACE PAGE ADDRESS REGISTER ADDRESSES
003322  172362                  KDPAR1: 172362
003324  172364                  KDPAR2: 172364
003326  172366                  KDPAR3: 172366
003330  172370                  KDPAR4: 172370
003332  172372                  KDPAR5: 172372
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003334  172374                  KDPAR6: 172374
003336  172376                  KDPAR7: 172376
        003336                  ADREND= .-2
003340  177600                  PDRTAB: 177600          ;TABLE OF ADDRESSES OF 1ST PDR OF EACH SET
003342  172200                          172200
003344  172300                          172300
003346  177640                  PARTAB: 177640          ;TABLE OF ADDRESSES OF 1ST PAR OF EACH SET
003350  172240                          172240
003352  172340                          172340

003354  003240                  STATAB: KIPDR0          ;KERNEL TABLE OF PDR'S AND PAR'S
003356  000000                          0
003360  003140                          SIPDR0          ;SUPERVISOR TABLE OF PDR'S AND PAR'S
003362  040000                          40000
003364  003040                          UIPDR0          ;USER TABLE OF PDR'S AND PAR'S
003366  140000                  STAEND: 140000
003370  000000                  STAPNT: 0
003372  177573                  SR0H:   177573          ;KT11-C STATUS REGISTER HIGH BYTE ADDRESSES
003374  177575                  SR1H:   177575
003376  177577                  SR2H:   177577
003400  177770                  UBRK:   177770          ;MICROBREAK REGISTER ADDRESS
003402  000000                  NRCNT:  0               ;COUNTER FOR TEST OF THE 3 NR KEYS
003404  000000  000003  000007  NRKEYS: 0,3,7           ;VALUES OF THE 3 NON RESIDENT KEYS
003412  125252                  DESTAD: 125252          ;LOCATION USED FOR READS AND WRITES TO CHECK
                                                        ;EXECUTION OR ABORTING AT CORRECT POINT


                                ;SET UP FOR START OF TESTS
003414  005037  177776          START:  CLR     @#PS
003420  012706  001000                  MOV     #KSTACK,SP              ;SETUP KERNEL STACK
003424  012737  040000  177776          MOV     #40000,@#PS             ;SETUP SUPERVISOR STACK POINTER
003432  012706  002000                  MOV     #SSTACK,SP
003436  012737  140000  177776          MOV     #140000,@#PS            ;SETUP USER STACK POINTER
003444  012706  003000                  MOV     #USTACK,SP
003450  005037  177776                  CLR     @#PS
003454  012767  002000  017132          MOV     #2000,ICOUNT            ;INITIALIZE ITERATION COUNT
003462  012767  003504  017130          MOV     #TEST1+2,RETURN         ;SETUP SCOPE AND ITERATION LOOP RETURN
003470  005067  177706                  CLR     NRCNT                   ;INITIALIZE FOR NR TEST
003474  012777  000007  177330          MOV     #7,@SR3                 ;ENABLE ALL D-SPACES

                                ;SHOW THAT DATI TO A RROT PAGE (ACF=1) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
003502  104400                  TEST1:  SCOPE
003504  012737  000001  177570          MOV     #1,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
003512  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
003516  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
003522  005077  177276                  CLR     @SR0            ;INITIALIZE SR0
003526  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
003532  004767  016552                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
003536  005726                  TST     (SP)+           ;RESTORE STACK
003540  012777  003700  177266          MOV     #RET1,@KTVEC    ;SETUP ABORT RETURN IN CASE
003546  005077  177264                  CLR     @KTSTA
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003552  012767  125252  177632          MOV     #125252,DESTAD  ;SETUP LOCATION TO BE REFERENCED
003560  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION TO
                                                                ;BE REFERENCED THRU KERNEL PAGE 1
003564  005277  177234                  INC     @SR0            ;TURN ON KT11-C
003570  022721  125252                  CMP     #125252,(R1)+   ;DATI TO RROT PAGE
003574  001404                          BEQ     CMPOK1          ;BRANCH IF CORRECT VALUE WAS READ
003576  005377  177222                  DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
003602  104006                          HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 1
003604  000441                          BR      DONE1
003606  017702  177212          CMPOK1: MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
003612  105377  177206                  DECB    @SR0            ;TURN OFF KT11-C
003616  022702  010021                  CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
003622  001401                          BEQ     .+4
003624  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0, AND MMGT TRAP SHOULD BE SET
003626  022777  000027  177172          CMP     #27,@SR1        ;CHECK SR1
003634  001401                          BEQ     .+4
003636  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
003640  022777  003640  177162          CMP     #.,@SR2         ;CHECK SR2
003646  001401                          BEQ     .+4
003650  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
003652  022777  077401  177362          CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
003660  001401                          BEQ     .+4             ;THE RROT PAGE REFERENCED
003662  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE
                                                                ;RROT REFERENCE WAS TO DATA SPACE
003664  022777  077601  177370          CMP     #77601,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
003672  001401                          BEQ     .+4             ;TO THE RROT REFERENCE
003674  104006                          HLT                     ;KDPDR1 INCORRECT-"A" BIT SHOULD
                                                                ;BE SET SINCE DATA SPACE WAS READ
                                                                ;AND WAS RROT
003676  000404                          BR      DONE1
003700  042777  000001  177116  RET1:   BIC     #1,@SR0         ;TURN OFF KT11-C
003706  104006                          HLT                     ;DATI TO RROT PAGE CAUSED
                                                                ;A TRAP OR ABORT ALTHOUGH MEMORY
                                                                ;MANAGEMENT TRAP ENABLE WAS NOT SET
003710  016777  177122  177116  DONE1:  MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
003716  005077  177114                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
003722  005077  177076                  CLR     @SR0            ;INITIALIZE SR0
003726  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATI TO A RROT PAGE (ACF=1) WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
003732  104400          TEST2:  SCOPE
003734  012737  000002  177570          MOV     #2,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
003742  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
003746  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
003752  005077  177046                  CLR     @SR0            ;INITIALIZE SR0
003756  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
003762  004767  016322                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT, BANK 0
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                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
003766  005726                          TST     (SP)+   ;RESTORE STACK POINTER
003770  012777  004036  177036          MOV     #RET2,@KTVEC    ;SETUP TRAP RETURN
003776  005077  177034                  CLR     @KTSTA
004002  012767  125252  177402          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
004010  005003                          CLR     R3      ;CLEAR REGISTER TO SAVE WHAT WAS READ
                                                        ;ALLOWS CHECKING TO SEE THAT THE
                                                        ;INSTRUCTION COMPLETED BEFORE
                                                        ;TRAPPING
004012  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
004016  012777  001001  177000          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
004024  012103                          MOV     (R1)+,R3        ;DATI TO RROT PAGE
004026  105077  176772                  CLRB    @SR0    ;IF NO TRAP, TURN OFF KT11-C
004032  104006                          HLT             ;DATI TO RROT PAGE WITH MEMORY
004034  000440                          BR      DONE2   ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                        ;CAUSE A TRAP
004036  017702  176762          RET2:   MOV     @SR0,R2 ;SAVE CONTENTS OF SR0
004042  005377  176756                  DEC     @SR0    ;TURN OFF KT11-C
004046  022702  011021                  CMP     #11021,R2       ;CHECK SAVED CONTENTS OF SR0
004052  001401                          BEQ     .+4
004054  104006                          HLT
                                                        ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                        ;THE REFERENCE TO DATA SPACE, PAGE
                                                        ;0, WHICH GOT THE ADDRESS OF SR0,
                                                        ;AND MMGT TRAP SHOULD BE SET
004056  022777  000027  176742          CMP     #27,@SR1        ;CHECK SR1
004064  001401                          BEQ     .+4
004066  104006                          HLT
                                                        ;SR1 INCORRECT-SHOULD CONTINUE
                                                        ;TRACKING WITH KT11-C OFF
004070  022777  004070  176732          CMP     #.,@SR2 ;CHECK SR2
004076  001401                          BEQ     .+4
004100  104006                          HLT
                                                        ;SR2 INCORRECT-SHOULD STILL BE
                                                        ;TRACKING EVEN WITH KT11-C OFF
004102  022777  077401  177132          CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
004110  001401                          BEQ     .+4
004112  104006                          HLT
                                                        ;KIPDR1 INCORRECT-SHOULD NOT
                                                        ;HAVE BEEN CHANGED SINCE THE RROT
                                                        ;REFERENCE WAS TO DATA SPACE
004114  022777  077601  177140          CMP     #77601,@KDPDR1  ;CHECK DATA SPACE PDR
004122  001401                          BEQ     .+4
004124  104006                          HLT
                                                        ;KDPDR1 INCORRECT-"A" BIT SHOULD
                                                        ;BE SET SINCE DATA SPACE WAS RROT
                                                        ;AND WAS READ
004126  022703  125252                  CMP     #125252,R3      ;CHECK LOCATION WRITTEN INTO
004132  001401                          BEQ     .+4
004134  104006                          HLT
                                                        ;THE INSTRUCTION REFERENCING THE RROT
                                                        ;PAGE TRAPPED BEFORE COMPLETING
                                                        ;OR RELOCATION FAILED SINCE THE
                                                        ;MOVE DID NOT CORRECTLY LOAD R3
004136  016777  176674  176670  DONE2:  MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
004144  005077  176666                  CLR     @KTSTA  ;CAUSE A HALT ON AN UNEXPECTED TRAP
004150  005077  176650                  CLR     @SR0
004154  005037  177776                  CLR     @#PS

                        ;SHOW THAT A DATO (NO DATIP) TO A RROT PAGE (ACF=1) WITHOUT
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                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING THE DATO
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
004160  104400                  TEST3:  SCOPE
004162  012737  000003  177570          MOV     #3,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
004170  005037  177776          CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
004174  012706  001000          MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
004200  005077  176620          CLR     @SR0            ;INITIALIZE SR0
004204  012746  000001          MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
004210  004767  016074          JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT, BANK 0
                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
004214  005726                  TST     (SP)+           ;RESTORE STACK POINTER
004216  012777  004264  176610  MOV     #RET3,@KTVEC    ;SETUP ABORT RETURN
004224  005077  176606          CLR     @KTSTA
004230  005067  177156          CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                        ;BY DATO TO RROT PAGE
004234  012701  023412          MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
004240  112777  000001  176556  MOVB    #1,@SR0         ;TURN ON KT11-C
004246  012721  125252  AD3:    MOV     #125252,(R1)+   ;DATO TO RROT PAGE-SHOULD ABORT
004252  042777  000001  176544  BIC     #1,@SR0         ;TURN OFF KT11-C
004260  104006                  HLT                     ;DATO TO RROT PAGE FAILED TO ABORT
004262  000440                  BR      DONE3
004264  017702  176534  RET3:   MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
004270  005377  176530          DEC     @SR0            ;TURN OFF KT11-C
004274  022702  020023          CMP     #20023,R2       ;CHECK SAVED CONTENTS OF SR0
004300  001401                  BEQ     .+4
004302  104006                  HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON DATO TO KERNEL DATA SPACE PAGE 1(RROT)
                                                        ;AND MMGT TRAP SHOULD BE SET
004304  022777  010427  176514  CMP     #10427,@SR1     ;CHECK SR1
004312  001401                  BEQ     .+4
004314  104006                  HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, WHICH
                                                        ;AUTOINCREMENTED R7, AND THEN R1
004316  022777  004246  176504  CMP     #AD3,@SR2       ;CHECK SR2
004324  001401                  BEQ     .+4
004326  104006                  HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, WITH THE
                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
004330  022777  077401  176704  CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
004336  001401                  BEQ     .+4
004340  104006                  HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED SINCE THE RROT REFERENCE
                                                        ;WAS TO DATA SPACE
004346  022777  077401  176712  CMP     #77401,@KDPDR1  ;CHECK DATA SPACE PDR
004350  001401                  BEQ     .+4
004352  104006                  HLT                     ;KDPDR1 INCORRECT-SHOULD NOT
                                                        ;HAVE BEEN CHANGED SINCE DATO
                                                        ;DIDN'T WRITE AND WAS NOT A READ
004354  005767  177032          TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
004360  001401                  BEQ     .+4             ;LOCATION WAS NOT WRITTEN
004362  104006                  HLT                     ;DATO TO RROT PAGE WROTE
                                                        ;INTO THE DESTINATION LOCATION
004364  016777  176446  176442  DONE3:  MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
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004372  005077  176440                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
004376  005077  176422                  CLR     @SR0
004402  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATO (NO DATIP) TO A RROT PAGE (ACF=1) WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
                                TEST4:  SCOPE
004406  104400
004410  012737  000004  177570          MOV     #4,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
004416  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
004422  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
004426  005077  176372                  CLR     @SR0            ;INITIALIZE SR0
004432  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
004436  004767  015646                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
004442  005726                          TST     (SP)+           ;RESTORE STACK POINTER
004444  012777  004510  176362          MOV     #RET4,@KTVEC    ;SETUP ABORT RETURN
004452  005077  176360                  CLR     @KTSTA
004456  005067  176730                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RROT PAGE
004462  012702  023412                  MOV     #DESTAD+20000,R2        ;R2 CONTAINS ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
004466  012777  001001  176330          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
004474  012722  125252          AD4:    MOV     #125252,(R2)+   ;DATO TO RROT PAGE-SHOULD ABORT
004500  005377  176320                  DEC     @SR0            ;TURN OFF KT11-C
004504  104006                          HLT                     ;DATO TO RROT PAGE FAILED TO ABORT
004506  000440                          BR      DONE4
004510  017701  176310          RET4:   MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
004514  005377  176304                  DEC     @SR0            ;TURN OFF KT11-C
004520  022701  021023                  CMP     #21023,R1       ;CHECK SAVED CONTENTS OF SR0
004524  001401                          BEQ     .+4
004526  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA SPACE PAGE 1(RROT)
                                                                ;AND ACCESS FAULT SHOULD BE SET
004530  022777  011027  176270          CMP     #11027,@SR1     ;CHECK SR1
004536  001401                          BEQ     .+4
004540  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                ;INCREMENTED R7, AND THEN R2
004542  022777  004474  176260          CMP     #AD4,@SR2       ;CHECK SR2
004550  001401                          BEQ     .+4
004552  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WITH THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
004554  022777  077401  176460          CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
004562  001401                          BEQ     .+4
004564  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RROT
                                                                ;REFERENCE WAS TO DATA SPACE
004566  022777  077401  176466          CMP     #77401,@KDPDR1  ;CHECK DATA SPACE PDR
004574  001401                          BEQ     .+4
004576  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE DATO
                                                                ;DIDN'T WRITE AND REFERENCE WAS
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                                                                ;NOT A READ
004600  005767  176606                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
004604  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
004606  104006                          HLT                     ;DATO TO RROT PAGE WROTE
                                                                ;INTO THE DESTINATION LOCATION
004610  016777  176222  176216  DONE4:  MOV     KTSTA,@KTVEC    ;CHANGE KT11-C TRAP RETURN
004616  005077  176214                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
004622  005077  176176                  CLR     @SR0
004626  005037  177776                  CLR     @#PS


                                ;SHOW THAT A DATIP, DATO SEQUENCE TO A RROT PAGE (ACF=1) WITHOUT
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
004632  104400                  TEST5:  SCOPE
004634  012737  000005  177570          MOV     #5,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
004642  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
004646  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
004652  005077  176146                  CLR     @SR0            ;INITIALIZE SR0
004656  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
004662  004767  015422                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT,BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
004666  005726                          TST     (SP)+           ;RESTORE STACK POINTER
004670  012777  004734  176136          MOV     #RET5,@KTVEC    ;SETUP ABORT RETURN
004676  005077  176134                  CLR     @KTSTA
004702  005067  176504                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATO TO RROT PAGE
004706  012703  023414                  MOV     #DESTAD+20002,R3        ;R3 CONTAINS VIRTUAL ADDRESS+2 OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
004712  052777  000001  176104          BIS     #0001,@SR0      ;TURN ON KT11-C
004720  005243                  AD5:    INC     -(R3)           ;DATIP, DATO TO RROT PAGE
004722  042777  000001  176074          BIC     #1,@SR0         ;TURN OFF KT11-C
004730  104006                          HLT                     ;DATIP, DATO TO RROT PAGE FAILED TO
004732  000441                          BR      DONE5           ;ABORT
004734  017701  176064          RET5:   MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
004740  042777  000001  176056          BIC     #1,@SR0         ;TURN OFF KT11-C
004746  022701  020023                  CMP     #20023,R1       ;CHECK SAVED CONTENTS OF SR0
004752  001401                          BEQ     .+4
004754  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(RROT) AND
                                                                ;ACCESS FAULT SHOULD BE SET
004756  022777  000363  176042          CMP     #363,@SR1       ;CHECK SR1
004764  001401                          BEQ     .+4
004766  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH
                                                                ;AUTODECREMENTED R3
004770  022777  004720  176032          CMP     #AD5,@SR2       ;CHECK SR2
004776  001401                          BEQ     .+4
005000  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WITH THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
005002  022777  077401  176232          CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
005010  001401                          BEQ     .+4
005012  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
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                                                                ;BEEN CHANGED SINCE THE RROT
                                                                ;REFERENCE WAS TO DATA SPACE
005014  022777  077401  176240          CMP     #77401,@KDPDR1  ;CHECK DATA SPACE PDR
005022  001401                          BEQ     .+4
005024  104006                          HLT
                                                                ;KDPDR1 INCORRECT - SHOULD NOT HAVE
                                                                ;BEEN CHANGED, SINCE DATIP IS ABORTED
                                                                ;SINCE IT WILL BE FOLLOWED BY A DATC OR DATOB
005026  005767  176360                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
005032  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
005034  104006                          HLT                     ;DATO TO RROT PAGE WROTE INTO
                                                                ;THE DESTINATION LOCATION
005036  016777  175774  175770  DONE5:  MOV     KTSTA,@KTVEC    ;CHANGE PAGE FAULT RETURN
005044  005077  175766                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED
005050  005077  175750                  CLR     @SR0            ;TRAP
005054  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATIP, DATO SEQUENCE TO A RROT PAGE (ACF=1) WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
005060  104400                  TEST6:  SCOPE
005062  012737  000006  177570          MOV     #6,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
005070  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
005074  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
005100  005077  175720                  CLR     @SR0            ;INITIALIZE SR0
005104  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
005110  004767  015174                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT,BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
005114  005726                          TST     (SP)+           ;RESTORE STACK POINTER
005116  012777  005162  175710          MOV     #RET6,@KTVEC    ;SETUP ABORT RETURN
005124  005077  175706                  CLR     @KTSTA
005130  005067  176256                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATO TO RROT PAGE
005134  012703  023414                  MOV     #DESTAD+20002,R3        ;R3 CONTAINS VIRTUAL ADDRESS+2 OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
005140  052777  001001  175656          BIS     #1001,@SR0      ;TURN ON KT11-C
005146  005243          AD6:    INC     -(R3)           ;DATIP, DATO TO RROT PAGE
005150  042777  000001  175646          BIC     #1,@SR0         ;TURN OFF KT11-C
005156  104006                          HLT                     ;DATIP, DATO TO RROT PAGE FAILED TO
005160  000441                          BR      DONE6           ;ABORT
005162  017701  175636          RET6:   MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
005166  042777  000001  175630          BIC     #1,@SR0         ;TURN OFF KT11-C
005174  022701  021023                  CMP     #21023,R1       ;CHECK SAVED CONTENTS OF SR0
005200  001401                          BEQ     .+4
005202  104006                          HLT
                                                                ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(RROT) AND
                                                                ;ACCESS FAULT SHOULD BE SET
005204  022777  000363  175614          CMP     #363,@SR1       ;CHECK SR1
005212  001401                          BEQ     .+4
005214  104006                          HLT
                                                                ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH
                                                                ;AUTODECREMENTED R3
005216  022777  005146  175604          CMP     #AD6,@SR2       ;CHECK SR2
005224  001401                          BEQ     .+4
005226  104006                          HLT
                                                                ;SR2 INCORRECT-SHOULD HAVE LOCKED
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                                                        ;ON THE ABORTED REFERENCE, WITH THE
                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
005230  022777  077401  176004          CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
005236  001401                          BEQ     .+4
005240  104006                          HLT
                                                        ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED SINCE THE RRCT
                                                        ;REFERENCE WAS TO DATA SPACE
005242  022777  077401  176012          CMP     #77401,@KDPDR1  ;CHECK DATA SPACE PDR
005250  001401                          BEQ     .+4
005252  104006                          HLT
                                                        ;KDPDR1 INCORRECT - SHOULD NOT HAVE
                                                        ;BEEN CHANGED, SINCE DATIP IS ABORTED
                                                        ;SINCE IT WILL BE FOLLOWED BY A DATO OR DATOB
005254  005767  176132                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
005260  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
005262  104006                          HLT                     ;DATO TO RROT PAGE WROTE INTO
                                                        ;THE DESTINATION LOCATION
005264  016777  175546  175542  DONE6:  MOV     KTSTA,@KTVEC    ;CHANGE PAGE FAULT RETURN
005272  005077  175540                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED
005276  005077  175522                  CLR     @SR0            ;TRAP
005302  005037  177776                  CLR     @#PS


                        ;SHOW THAT A DATIP,DATOB SEQUENCE TO A RROT PAGE (ACF=1) WITHOUT
                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
005306  104400          TEST7:  SCOPE
005310  012737  000007  177570          MOV     #7,@#SR         ;LOAD TEST NUMBER INTO THE DISPLAY
005316  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
005322  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
005326  005077  175472                  CLR     @SR0            ;INITIALIZE SR0
005332  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
005336  004767  014746                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT, BANK 0
                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
005342  005726                          TST     (SP)+           ;RESTORE STACK POINTER
005344  012777  005406  175462          MOV     #RET7,@KTVEC    ;SETUP ABORT RETURN
005352  005077  175460                  CLR     @KTSTA
005356  005067  176030                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                        ;BY DATIP,DATOB TO RROT PAGE
005362  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
005366  052777  000001  175430          BIS     #0001,@SR0      ;TURN ON KT11-C
005374  105224                  AD7:    INCB    (R4)+           ;DATIP, DATOB TO RROT PAGE
005376  005377  175422                  DEC     @SR0            ;TURN OFF KT11-C
005402  104006                          HLT                     ;DATIP,DATO TO RROT PAGE FAILED TO ABORT
005404  000440                          BR      DONE7
005406  017701  175412          RET7:   MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
005412  005377  175406                  DEC     @SR0            ;TURN OFF KT11-C
005416  022701  020023                  CMP     #20023,R1       ;CHECK SAVED CONTENTS OF SR0
005422  001401                          BEQ     .+4
005424  104006                          HLT
                                                        ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
                                                        ;DATOB TO KERNEL DATA PAGE 1 (RROT)
                                                        ;ACCESS FAULT SHOULD BE SET
005426  022777  000014  175372          CMP     #14,@SR1        ;CHECK SR1
005434  001401                          BEQ     .+4
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005436  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                ;INCREMENTED R4
005440  022777  005374  175362          CMP     #AD7,@SR2       ;CHECK SR2
005446  001401                          BEQ     .+4
005450  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WITH THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
005452  022777  077401  175562          CMP     #77401,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
005460  001401                          BEQ     .+4
005462  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
005464  022777  077401  175570          CMP     #77401,@KDPDR1  ;CHECK DATA SPACE PDR
005472  001401                          BEQ     .+4
005474  104006                          HLT                     ;KDPDR1 INCORRECT - SHOULD NOT HAVE
                                                                ;BEEN CHANGED-DATOB IS ABORTED
                                                                ;SINCE IT MUST BE FOLLOWED BY A DATO
005476  005767  175710                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
005502  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
005504  104006                          HLT                     ;DATOB TO RROT PAGE WROTE INTO
                                                                ;THE DESTINATION LOCATION
005506  016777  175324  175320  DONE7:  MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT
005514  005077  175316                  CLR     @KTSTA          ;RETURN TO CAUSE A HALT ON AN
005520  005077  175300                  CLR     @SR0            ;UNEXPECTED TRAP
005524  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATIP,DATOB SEQUENCE TO A RROT PAGE (ACF=1) WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
005530  104400                  TEST10: SCOPE
005532  012737  000010  177570          MOV     #10,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
005540  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
005544  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
005550  005077  175250                  CLR     @SR0            ;INITIALIZE SR0
005554  012746  000001                  MOV     #1,-(SP)        ;PUSH RROT KEY ON STACK
005560  004767  014524                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RROT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
005564  005726                          TST     (SP)+           ;RESTORE STACK POINTER
005566  012777  005630  175240          MOV     #RET10,@KTVEC   ;SETUP ABORT RETURN
005574  005077  175236                  CLR     @KTSTA
005600  005067  175606                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATOB TO RROT PAGE
005604  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
005610  052777  001001  175206          BIS     #1001,@SR0      ;TURN ON KT11-C
005616  105224          AD10:   INCB    (R4)+                   ;DATIP, DATOB TO RROT PAGE
005620  005377  175200                  DEC     @SR0            ;TURN OFF KT11-C
005624  104006                          HLT                     ;DATIP,DATO TO RROT PAGE FAILED TO ABORT
005626  000440                          BR      DONE10
005630  017701  175170          RET10:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
005634  005377  175164                  DEC     @SR0            ;TURN OFF KT11-C
005640  022701  021023                  CMP     #21023,R1       ;CHECK SAVED CONTENTS OF SR0
005644  001401                          BEQ     .+4
005646  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
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                                                                ;DATOB TO KERNEL DATA PAGE 1 (PROT)
                                                                ;ACCESS FAULT SHOULD BE SET
005650  022777  000014  175150          CMP     #14,@SR1      ;CHECK SR1
005656  001401                          BEQ     .+4
005660  104006                          HLT
                                                                ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                ;INCREMENTED R4
005662  022777  005616  175140          CMP     #AD10,@SR2    ;CHECK SR2
005670  001401                          BEQ     .+4
005672  104006                          HLT
                                                                ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WITH THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
005674  022777  077401  175340          CMP     #77401,@KIPDR1 ;CHECK INSTRUCTION SPACE PDR
005702  001401                          BEQ     .+4
005704  104006                          HLT
                                                                ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
005706  022777  077401  175346          CMP     #77401,@KDPDR1 ;CHECK DATA SPACE PDR
005714  001401                          BEQ     .+4
005716  104006                          HLT
                                                                ;KDPDR1 INCORRECT - SHOULD NOT HAVE
                                                                ;BEEN CHANGED-DATIP IS ABORTED
                                                                ;SINCE IT MUST BE FOLLOWED BY A DATO
005720  005767  175466                  TST     DESTAD        ;MAKE CERTAIN THAT DESTINATION
005724  001401                          BEQ     .+4           ;LOCATION WAS NOT WRITTEN
005726  104006                          HLT                   ;DATOB TO RROT PAGE WROTE INTO
                                                                ;THE DESTINATION LOCATION
005730  016777  175102  175076  DONE10: MOV     KTSTA,@KTVEC  ;CHANGE KT11-C FAULT
005736  005077  175074                  CLR     @KTSTA        ;RETURN TO CAUSE A HALT ON AN
005742  005077  175056                  CLR     @SR0          ;UNEXPECTED TRAP
005746  005037  177776                  CLR     @#PS

                                        ;SHOW THAT DATI TO A RRO PAGE (ACF=2) WITHOUT MEMORY
                                        ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
005752  104400                  TEST11: SCOPE
005754  012737  000011  177570          MOV     #11,@#SR      ;LOAD TEST NUMBER INTO THE DISPLAY
005762  005037  177776                  CLR     @#PS          ;INITIALIZE PROCESSOR STATUS
005766  012706  001000                  MOV     #KSTACK,SP    ;INITIALIZE KERNEL STACK POINTER
005772  005077  175026                  CLR     @SR0          ;INITIALIZE SR0
005776  012746  000002                  MOV     #2,-(SP)      ;PUSH RRO KEY ON STACK
006002  004767  014302                  JSR     %7,SETUP      ;MAKE KERNEL PAGE 1 RRO, BANK 0
                                                              ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                              ;MAKE ALL OTHER PAGES RW, BANK 0
006006  005726                          TST     (SP)+         ;RESTORE STACK POINTER
006010  012777  006150  175016          MOV     #RET11,@KTVEC ;SETUP ABORT RETURN IN CASE
006016  005077  175014                  CLR     @KTSTA
006022  012767  125252  175362          MOV     #125252,DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
006030  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                              ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
006034  005277  174764                  INC     @SR0          ;TURN ON KT11-C
006040  022721  125252                  CMP     #125252,(R1)+ ;DATI TO RRO PAGE
006044  001404                          BEQ     OK11
006046  005377  174752                  DEC     @SR0          ;ON ERROR, TURN OFF KT11-C
006052  104006                          HLT                   ;RELOCATION FAILED THRU KERNEL PAGE 1
006054  000441                          BR      DONE11
006056  017702  174742          OK11:   MOV     @SR0,R2       ;SAVE CONTENTS OF SR0
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006062  105377  174736                  DECB    @SR0            ;TURN OFF KT11-C
006066  022702  000021                  CMP     #21,R2          ;CHECK SAVED CONTENTS OF SR0
006072  001401                          BEQ     .+4
006074  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS OF SR0
006076  022777  000027  174722          CMP     #27,@SR1        ;CHECK SR1
006104  001401                          BEQ     .+4
006106  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
006110  022777  006110  174712          CMP     #.,@SR2         ;CHECK SR2
006116  001401                          BEQ     .+4
006120  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
006122  022777  077402  175112          CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
006130  001401                          BEQ     .+4             ;THE RRO PAGE REFERENCED
006132  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
006134  022777  077402  175120          CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
006142  001401                          BEQ     .+4             ;TO THE RRO REFERENCE
006144  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT HAVE
006146  000404                          BR      DONE11          ;CHANGED SINCE PAGE WAS NOT WRITTEN
006150  042777  000001  174646  RET11:  BIC     #1,@SR0         ;TURN OFF KT11-C
006156  104006                          HLT                     ;DATI TO RRO PAGE CAUSED
                                                                ;A TRAP OR ABORT
006160  016777  174652  174646  DONE11: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
006166  005077  174644                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
006172  005077  174626                  CLR     @SR0            ;INITIALIZE SR0
006176  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                        ;SHOW THAT A DATI TO A RRO PAGE (ACF=2) WITH MEMORY MANAGEMENT
                                        ;TRAP ENABLE SET DOESN'T TRAP OR ABORT
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                        ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
006202  104400                  TEST12: SCOPE
006204  012737  000012  177570          MOV     #12,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
006212  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
006216  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
006222  005077  174576                  CLR     @SR0            ;INITIALIZE SR0
006226  012746  000002                  MOV     #2,-(SP)        ;PUSH RRO KEY ON STACK
006232  004767  014052                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRO, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
006236  005726                          TST     (SP)+           ;RESTORE STACK POINTER
006240  012777  006402  174566          MOV     #RET12,@KTVEC   ;SETUP TRAP RETURN
006246  005077  174564                  CLR     @KTSTA
006252  012767  125252  175132          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
006260  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION TO BE
                                                                ;REFERENCED THRU KERNEL PAGE 1
006264  012777  001001  174532          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
006272  022721  125252                  CMP     #125252,(R1)+   ;DATI TO RRO PAGE
006276  001404                          BEQ     OK12
006300  005377  174520                  DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
006304  104006                          HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 1
006306  000441                          BR      DONE12
006310  017702  174510          OK12:   MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
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006314  005377  174504                  DEC     @SR0            ;TURN OFF KT11-C
006320  022702  001021                  CMP     #1021,R2        ;CHECK SAVED CONTENTS OF SR0
006324  001401                          BEQ     .+4
006326  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE
                                                                ;0 WHICH GOT THE ADDRESS OF SR0
006330  022777  000027  174470          CMP     #27,@SR1        ;CHECK SR1
006336  001401                          BEQ     .+4
006340  104006                          HLT                     ;SR1 INCORRECT-SHOULD CONTINUE
                                                                ;TRACKING WITH KT11-C OFF
006342  022777  006342  174460          CMP     #.,@SR2         ;CHECK SR2
006350  001401                          BEQ     .+4
006352  104006                          HLT                     ;SR2 INCORRECT-SHOULD STILL BE
                                                                ;TRACKING WITH KT11-C OFF
006354  022777  077402  174660          CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
006362  001401                          BEQ     .+4
006364  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE CHANGED
006366  022777  077402  174666          CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR
006374  001401                          BEQ     .+4
006376  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT HAVE CHANGED
006400  000404                          BR      DONE12
006402  042777  000001  174414  RET12:  BIC     #1,@SR0         ;TURN OFF KT11-C
006410  104006                          HLT                     ;DATI TO RR0 PAGE CAUSED A TRAP OR ABORT
006412  016777  174420  174414  DONE12: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
005420  005077  174412                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
006424  005077  174374                  CLR     @SR0
006430  005037  177776                  CLR     @#PS

                                        ;SHOW THAT A DATO (NO DATIP) TO A RR0 PAGE (ACF=2) WITHOUT
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING THE DATO
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
006434  104400                  TEST13: SCOPE
006436  012737  000013  177570          MOV     #13,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
006444  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
006450  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
006454  005077  174344                  CLR     @SR0            ;INITIALIZE SR0
006460  012746  000002                  MOV     #2,-(SP)        ;PUSH RR0 KEY ON STACK
006464  004767  013620                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RR0, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
006470  005726                          TST     (SP)+           ;RESTORE STACK
006472  012777  006540  174334          MOV     #RET13,@KTVEC   ;SETUP ABORT RETURN
006500  005077  174332                  CLR     @KTSTA
006504  005067  174702                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RR0 PAGE
006510  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
006514  112777  000001  174302          MOVB    #1,@SR0         ;TURN ON KT11-C
006522  012721  125252          AD13:   MOV     #125252,(R1)+   ;DATO TO RR0 PAGE-SHOULD ABORT
006526  042777  000001  174270          BIC     #1,@SR0         ;TURN OFF KT11-C
006534  104006                          HLT                     ;DATO TO RR0 PAGE FAILED TO ABORT
006536  000440                          BR      DONE13
006540  017702  174260          RET13:  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
006544  005377  174254                  DEC     @SR0            ;TURN OFF KT11-C
006550  022702  020023                  CMP     #20023,R2       ;CHECK SAVED CONTENTS OF SR0
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006554  001401                          BEQ     .+4
006556  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(RRO)
                                                                ;AND ACCESS VIOLATION SHOULD BE SET
006560  022777  010427  174240          CMP     #10427,@SR1     ;CHECK SR1
006566  001401                          BEQ     .+4
006570  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH
                                                                ;AUTOINCREMENTED R7, AND THEN R1
006572  022777  006522  174230          CMP     #AD13,@SR2      ;CHECK SR2
006600  001401                          BEQ     .+4
006602  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WITH THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
006604  022777  077402  174430          CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
006612  001401                          BEQ     .+4
006614  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
006616  022777  077402  174436          CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR
006624  001401                          BEQ     .+4
006626  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
006630  005767  174556                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
006634  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
006636  104006                          HLT                     ;DATO TO RRO PAGE WROTE
                                                                ;INTO THE DESTINATION LOCATION
006640  016777  174172  174166  DONE13: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
006646  005077  174164                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
006652  005077  174146                  CLR     @SR0
006656  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATO (NO DATIP) TO A RRO PAGE (ACF=2) WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
006662  104400                  TEST14: SCOPE
006664  012737  000014  177570          MOV     #14,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
006672  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
006676  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
006702  005077  174116                  CLR     @SR0            ;INITIALIZE SR0
006706  012746  000002                  MOV     #2,-(SP)        ;PUSH RRO KEY ON STACK
006712  004767  013372                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRO, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
006716  005726                          TST     (SP)+           ;RESTORE STACK
006720  012777  006764  174106          MOV     #RET14,@KTVEC   ;SETUP ABORT RETURN
006726  005077  174104                  CLR     @KTSTA
006732  005067  174454                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RRO PAGE
006736  012702  023412                  MOV     #DESTAD+20000,R2        ;R2 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
006742  012777  001001  174054          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
006750  012722  125252          AD14:   MOV     #125252,(R2)+   ;DATO TO RRO PAGE-SHOULD ABORT
006754  105377  174044                  DECB    @SR0            ;TURN OFF KT11-C
006760  104006                          HLT                     ;DATO TO RRO PAGE FAILED TO ABORT
006762  000440                          BR      DONE14
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006764  017701  174034          RET14:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
006770  005377  174030                  DEC     @SR0            ;TURN OFF KT11-C
006774  022701  021023                  CMP     #21023,R1       ;CHECK SAVED CONTENTS OF SR0
007000  001401                          BEQ     .+4
007002  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(RR0)
                                                                ;AND ACCESS FAULT SHOULD BE SET
007004  022777  011027  174014          CMP     #11027,@SR1     ;CHECK SR1
007012  001401                          BEQ     .+4
007014  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                ;INCREMENTED R7, AND THEN R2
007016  022777  006750  174004          CMP     #AD14,@SR2      ;CHECK SR2
007024  001401                          BEQ     .+4
007026  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WITH THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
007030  022777  077402  174204          CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
007036  001401                          BEQ     .+4
007040  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
007042  022777  077402  174212          CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR
007050  001401                          BEQ     .+4
007052  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
007054  005767  174332                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
007060  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
007062  104006                          HLT                     ;DATO TO RR0 PAGE WROTE
                                                                ;INTO THE DESTINATION LOCATION
007064  016777  173746  173742  DONE14: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
007072  005077  173740                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
007076  005077  173722                  CLR     @SR0
007102  005037  177776                  CLR     @#PS


                                ;SHOW THAT A DATIP, DATO SEQUENCE TO A RR0 PAGE (ACF=2) WITHOUT
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
007106  104400          TEST15: SCOPE
007110  012737  000015  177570          MOV     #15,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
007116  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
007122  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
007126  005077  173672                  CLR     @SR0            ;INITIALIZE SR0
007132  012746  000002                  MOV     #2,-(SP)        ;PUSH RR0 KEY ON STACK
007136  004767  013146                  JSR     %7, SETUP       ;MAKE KERNEL PAGE 1 RR0,BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
007142  005726                          TST     (SP)+           ;RESTORE STACK POINTER
007144  012777  007210  173662          MOV     #RET15,@KTVEC   ;SETUP ABORT RETURN
007152  005077  173660                  CLR     @KTSTA
007156  005067  174230                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATO TO RR0 PAGE
007162  012703  023414                  MOV     #DESTAD+20002,R3        ;R3 CONTAINS ADDRESS+2 OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
007166  052777  000001  173630          BIS     #1,@SR0 ;TURN ON KT11-C
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007174  005243                          AD15:   INC     -(R3)           ;DATIP, DATO TO RRO PAGE - SHOULD ABORT
007176  042777  000001  173620                  BIC     #1,@SR0         ;TURN OFF KT11-C
007204  104006                                  HLT                     ;DATIP, DATO TO RRO PAGE FAILED TO
007206  000441                                  BR      DONE15          ;ABORT
007210  017701  173610                  RET15:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
007214  042777  000001  173602                  BIC     #1,@SR0         ;TURN OFF KT11-C
007222  022701  020023                          CMP     #20023,R1       ;CHECK SAVED CONTENTS OF SR0
007226  001401                                  BEQ     .+4
007230  104006                                  HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                        ;ON DATIP, DATO TO KERNEL DATA PAGE 1(RRO)
                                                                        ;ACCESS FAULT SHOULD BE SET
007232  022777  000363  173566                  CMP     #363,@SR1       ;CHECK SR1
007240  001401                                  BEQ     .+4
007242  104006                                  HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                        ;ON THE ABORTED REFERENCE, WHICH
                                                                        ;AUTODECREMENTED R3
007244  022777  007174  173556                  CMP     #AD15,@SR2      ;CHECK SR2
007252  001401                                  BEQ     .+4
007254  104006                                  HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                        ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
007256  022777  077402  173756                  CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
007264  001401                                  BEQ     .+4
007266  104006                                  HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                        ;BEEN CHANGED
007270  022777  077402  173764                  CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR
007276  001401                                  BEQ     .+4
007300  104006                                  HLT                     ;KDPDR1 INCORRECT - SHOULD NOT HAVE
                                                                        ;BEEN CHANGED, SINCE THE INSTRUCTION WAS
                                                                        ;ABORTED BEFORE THE WRITE OCCURRED
007302  005767  174104                          TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
007306  001401                                  BEQ     .+4             ;LOCATION WAS NOT WRITTEN
007310  104006                                  HLT                     ;DATO TO RRO PAGE WROTE INTO
                                                                        ;THE DESTINATION LOCATION
007312  016777  173520  173514  DONE15: MOV     KTSTA,@KTVEC    ;CHANGE PAGE FAULT RETURN
007320  005077  173512                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED
007324  005077  173474                  CLR     @SR0            ;TRAP
007330  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATIP, DATO SEQUENCE TO A RRO PAGE (ACF=2) WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
007334  104400                  TEST16: SCOPE
007336  012737  000016  177570          MOV     #16,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
007344  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
007350  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
007354  005077  173444                  CLR     @SR0            ;INITIALIZE SR0
007360  012746  000002                  MOV     #2,-(SP)        ;PUSH RRO KEY ON STACK
007364  004767  012720                  JSR     %7, SETUP       ;MAKE KERNEL PAGE 1 RRO,BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
007370  005726                          TST     (SP)+           ;RESTORE STACK POINTER
007372  012777  007436  173434          MOV     #RET16,@KTVEC   ;SETUP ABORT RETURN
007400  005077  173432                  CLR     @KTSTA
007404  005067  174002                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
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                                                        ;BY DATIP,DATO TO RRO PAGE
007410  012703  023414                MOV     #DESTAD+20002,R3        ;R3 CONTAINS ADDRESS+2 OF LOCATION
                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
007414  052777  001001  173402        BIS     #1001,@SR0              ;TURN ON KT11-C
007422  005243                AD16:   INC     -(R3)                   ;DATIP, DATO TO RRO PAGE - SHOULD ABORT
007424  042777  000001  173372        BIC     #1,@SR0                 ;TURN OFF KT11-C
007432  104006                        HLT                             ;DATIP, DATO TO RRO PAGE FAILED TO
007434  000441                        BR      DONE16                  ;ABORT
007436  017701  173362        RET16:  MOV     @SR0,R1                 ;SAVE CONTENTS OF SR0
007442  042777  000001  173354        BIC     #1,@SR0                 ;TURN OFF KT11-C
007450  022701  021023                CMP     #21023,R1               ;CHECK SAVED CONTENTS OF SR0
007454  001401                        BEQ     .+4
007456  104006                        HLT                             ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON DATIP, DATO TO KERNEL DATA PAGE 1(RRO)
                                                        ;ACCESS FAULT SHOULD BE SET
007460  022777  000363  173340        CMP     #363,@SR1               ;CHECK SR1
007466  001401                        BEQ     .+4
007470  104006                        HLT                             ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, WHICH
                                                        ;AUTODECREMENTED R3
007472  022777  007422  173330        CMP     #AD16,@SR2              ;CHECK SR2
007500  001401                        BEQ     .+4
007502  104006                        HLT                             ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
007504  022777  077402  173530        CMP     #77402,@KIPDR1          ;CHECK INSTRUCTION SPACE PDR
007512  001401                        BEQ     .+4
007514  104006                        HLT                             ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED
007516  022777  077402  173536        CMP     #77402,@KDPDR1          ;CHECK DATA SPACE PDR
007524  001401                        BEQ     .+4
007526  104006                        HLT                             ;KDPDR1 INCORRECT - SHOULD NOT HAVE
                                                        ;BEEN CHANGED, SINCE THE INSTRUCTION WAS
                                                        ;ABORTED BEFORE THE WRITE OCCURRED
007530  005767  173656                TST     DESTAD                  ;MAKE CERTAIN THAT DESTINATION
007534  001401                        BEQ     .+4                     ;LOCATION WAS NOT WRITTEN
007536  104006                        HLT                             ;DATO TO RRO PAGE WROTE INTO
                                                        ;THE DESTINATION LOCATION
007540  016777  173272  173266  DONE16: MOV     KTSTA,@KTVEC            ;CHANGE PAGE FAULT RETURN
007546  005077  173264                CLR     @KTSTA                  ;TO CAUSE A HALT ON AN UNEXPECTED
007552  005077  173246                CLR     @SR0                    ;TRAP
007556  005037  177776                CLR     @#PS


                                        ;SHOW THAT A DATIP,DATOB SEQUENCE TO A RRO PAGE (ACF=2) WITHOUT
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
007562  104400                TEST17: SCOPE
007564  012737  000017  177570        MOV     #17,@#SR                ;LOAD TEST NUMBER INTO THE DISPLAY
007572  005037  177776                CLR     @#PS                    ;INITIALIZE PROCESSOR STATUS
007576  012706  001000                MOV     #KSTACK,SP              ;INITIALIZE KERNEL STACK POINTER
007602  005077  173216                CLR     @SR0                    ;INITIALIZE SR0
007606  012746  000002                MOV     #2,-(SP)                ;PUSH RR0 KEY ON STACK
007612  004767  012472                JSR     %7,SETUP                ;MAKE KERNEL PAGE 1 RR0, BANK 0
                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
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                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
007616  005726                          TST     (SP)+   ;RESTORE STACK POINTER
007620  012777  007662  173206          MOV     #RET17,@KTVEC   ;SETUP ABORT RETURN
007626  005077  173204                  CLR     @KTSTA
007632  005067  173554                  CLR     DESTAD  ;INITIALIZE LOCATION TO BE ADDRESSED
                                                        ;BY DATIP,DATOB TO RRO PAGE
007636  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS ADDRESS OF LOCATION
                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
007642  052777  000001  173154          BIS     #1,@SR0 ;TURN ON KT11-C
007650  105224          AD17:   INCB    (R4)+   ;DATIP, DATOB TO RRO PAGE - SHOULD ABORT
007652  005377  173146                  DEC     @SR0    ;TURN OFF KT11-C
007656  104006                          HLT             ;DATIP,DATO TO RRO PAGE FAILED
007660  000440                          BR      DONE17  ;TO ABORT
007662  017701  173136          RET17:  MOV     @SR0,R1 ;SAVE CONTENTS OF SR0
007666  005377  173132                  DEC     @SR0    ;TURN OFF KT11-C
007672  022701  020023                  CMP     #20023,R1       ;CHECK SAVED CONTENTS OF SR0
007676  001401                          BEQ     .+4
007700  104006                          HLT             ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
                                                        ;THE DATIP, DATOB TO KERNEL DATA PAGE 1 (RRO)
                                                        ;ACCESS FAULT SHOULD BE SET
007702  022777  000014  173116          CMP     #14,@SR1        ;CHECK SR1
007710  001401                          BEQ     .+4
007712  104006                          HLT             ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                        ;INCREMENTED R4 BY ONE
007714  022777  007650  173106          CMP     #AD17,@SR2      ;CHECK SR2
007722  001401                          BEQ     .+4
007724  104006                          HLT             ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
007726  022777  077402  173306          CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
007734  001401                          BEQ     .+4
007736  104006                          HLT             ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED
007740  022777  077402  173314          CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR
007746  001401                          BEQ     .+4
007750  104006                          HLT             ;KDPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED, SINCE THE INSTRUCTION WAS
                                                        ;ABORTED BEFORE THE WRITE OCCURRED
007752  005767  173434                  TST     DESTAD  ;MAKE CERTAIN THAT DESTINATION
007756  001401                          BEQ     .+4     ;LOCATION WAS NOT WRITTEN
007760  104006                          HLT             ;DATOB TO RRO PAGE WROTE INTO
                                                        ;THE DESTINATION LOCATION
007762  016777  173050  173044  DONE17: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT
007770  005077  173042                  CLR     @KTSTA  ;RETURN TO CAUSE A HALT ON AN
007774  005077  173024                  CLR     @SR0    ;UNEXPECTED TRAP
010000  005037  177776                  CLR     @#PS

                        ;SHOW THAT A DATIP,DATOB SEQUENCE TO A RRO PAGE (ACF=2) WITH
                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
010004  104400          TEST20: SCOPE
010006  012737  000020  177570          MOV     #20,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
010014  005037  177776                  CLR     @#PS    ;INITIALIZE PROCESSOR STATUS
010020  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
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010024  005077  172774                  CLR     @SR0            ;INITIALIZE SR0
010030  012746  000002                  MOV     #2,-(SP)        ;PUSH RR0 KEY ON STACK
010034  004767  012250                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RR0, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
010040  005726                          TST     (SP)+           ;RESTORE STACK POINTER
010042  012777  010104  172764          MOV     #RET20,@KTVEC   ;SETUP ABORT RETURN
010050  005077  172762                  CLR     @KTSTA
010054  005067  173332                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATOB TO RR0 PAGE
010060  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
010064  052777  001001  172732          BIS     #1001,@SR0      ;TURN ON KT11-C
010072  105224                  AD20:   INCB    (R4)+           ;DATIP, DATOB TO RR0 PAGE - SHOULD ABORT
010074  005377  172724                  DEC     @SR0            ;TURN OFF KT11-C
010100  104006                          HLT                     ;DATIP,DATO TO RR0 PAGE FAILED
010102  000440                          BR      DONE20          ;TO ABORT
010104  017701  172714          RET20:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
010110  005377  172710                  DEC     @SR0            ;TURN OFF KT11-C
010114  022701  021023                  CMP     #21023,R1       ;CHECK SAVED CONTENTS OF SR0
010120  001401                          BEQ     .+4
010122  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
                                                                ;THE DATIP, DATOB TO KERNEL DATA PAGE ' (RR0)
                                                                ;ACCESS FAULT SHOULD BE SET
010124  022777  000014  172674          CMP     #14,@SR1        ;CHECK SR1
010132  001401                          BEQ     .+4
010134  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                ;INCREMENTED R4 BY ONE
010136  022777  010072  172664          CMP     #AD20,@SR2      ;CHECK SR2
010144  001401                          BEQ     .+4
010146  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
010150  022777  077402  173064          CMP     #77402,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
010156  001401                          BEQ     .+4
010160  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
010162  022777  077402  173072          CMP     #77402,@KDPDR1  ;CHECK DATA SPACE PDR
010170  001401                          BEQ     .+4
010172  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED, SINCE THE INSTRUCTION WAS
                                                                ;ABORTED BEFORE THE WRITE OCCURRED
010174  005767  173212                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
010200  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
010202  104006                          HLT                     ;DATOB TO RR0 PAGE WROTE INTO
                                                                ;THE DESTINATION LOCATION
010204  016777  172626  172622  DONE20: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT
010212  005077  172620                  CLR     @KTSTA          ;RETURN TO CAUSE A HALT ON AN
010216  005077  172602                  CLR     @SR0            ;UNEXPECTED TRAP
010222  005037  177776                  CLR     @#PS

                        ;THE FOLLOWING TESTS (21-30) ARE RUN FOR EACH OF THE NON-RESIDENT
                        ;KEYS - A PASS IS MADE FOR KEY 0, THEN A PASS IS MADE FOR KEY 3,
                        ;AND FINALLY A PASS IS MADE FOR KEY 7
                        ;THE CURRENT KEY IS STORED ON THE STACK
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                                        ;SHOW THAT DATI TO A NR PAGE WITHOUT MEMORY
                                        ;MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
010226  104400                          TEST21: SCOPE
010230  005037  001000                          CLR     @#KSTACK        ;PUT 0 ON STACK AS FIRST NR KEY TO BE TESTED
                                                                        ;THIS INSTRUCTION IS SKIPPED WHEN TESTING THE
                                                                        ;OTHER 2 KEYS, WHICH ARE SETUP AFTER TEST30
010234  012737  000021  177570              MOV     #21,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
010242  005037  177776                      CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
010246  012706  001000                      MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
010252  005077  172546                      CLR     @SR0            ;INITIALIZE SR0
010256  004767  012026                      JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR, BANK 0
                                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
010262  012777  010326  172544              MOV     #RET21,@KTVEC   ;SETUP ABORT RETURN
010270  005077  172542                      CLR     @KTSTA
010274  005003                              CLR     R3              ;INITIALIZE DESTINATION LOCATION
010276  012767  125252  173106              MOV     #125252,DESTAD  ;INITIALIZE SOURCE LOCATION
010304  012701  023412                      MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
010310  005277  172510                      INC     @SR0            ;TURN ON KT11-C
010314  012103                  AD21:       MOV     (R1)+,R3        ;DATI TO NR PAGE - SHOULD ABORT
010316  005377  172502                      DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
010322  104006                              HLT                     ;NO ABORT ON DATI TO A NON-RESIDENT PAGE
010324  000445                              BR      DONE21
010326  017702  172472          RET21:      MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
010332  105377  172466                      DECB    @SR0            ;TURN OFF KT11-C
010336  022702  100023                      CMP     #100023,R2      ;CHECK SAVED CONTENTS OF SR0
010342  001401                              BEQ     .+4
010344  104006                              HLT
                                                                        ;SR0 INCORRECT-SHOULD HAVE
                                                                        ;LOCKED ON REFERENCE TO DATA SPACE,
                                                                        ;KERNEL PAGE 1 WHICH WAS NON-RESIDENT
010346  022777  000021  172452              CMP     #21,@SR1        ;CHECK SR1
010354  001401                              BEQ     .+4
010356  104006                              HLT
                                                                        ;SR1 INCORRECT-SHOULD HAVE
                                                                        ;LOCKED UP AFTER NR
                                                                        ;ACCESS AUTO INCREMENTED
                                                                        ;REGISTER 1 BY TWO
010360  022777  010314  172442              CMP     #AD21,@SR2      ;CHECK SR2
010366  001401                              BEQ     .+4
010370  104006                              HLT
                                                                        ;SR2 INCORRECT-SHOULD HAVE LOCKED ON
                                                                        ;NR REFERENCE
010372  017705  172644                      MOV     @KIPDR1,R5      ;MOVE CONTENTS OF KIPDR1 TO R5
010376  042705  000007                      BIC     #7,R5           ;TO MASK OFF ACCESS KEY
010402  022705  077400                      CMP     #77400,R5       ;CHECK INSTRUCTION SPACE PDR FOR
010406  001401                              BEQ     .+4             ;THE NR PAGE REFERENCED (BITS 0-2 MASKED OUT)
010410  104006                              HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                        ;HAVE BEEN CHANGED
010412  017704  172644                      MOV     @KDPDR1,R4      ;MOVE CONTENTS OF KDPDR1 TO R5
010416  042704  000007                      BIC     #7,R4           ;TO MASK OFF ACCESS KEY
010422  022704  077400                      CMP     #77400,R4       ;CHECK DATA SPACE PDR CORRESPONDING
010426  001401                              BEQ     .+4             ;TO THE RROT REFERENCE
010430  104006                              HLT                     ;KDPDR1 INCORRECT- SHOULD NOT
                                                                        ;HAVE BEEN CHANGED
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010432  005703                          TST     R3              ;CHECK DESTINATION LOCATION TO SEE
010434  001401                          BEQ     .+4             ;IF INSTRUCTION ALTERRED IT BEFORE ABORTING
010436  104006                          HLT                     ;INSTRUCTION COMPLETED BEFORE ABORT OCCURRED
010440  016777  172372  172366  DONE21: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CALSE HALT
010446  005077  172364                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
010452  005077  172346                  CLR     @SR0            ;INITIALIZE SR0
010456  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATI TO A NR PAGE WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET ABORTS WITHOUT COMPLETING
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
010462  104400                  TEST22: SCOPE
010464  012737  000022  177570          MOV     #22,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
010472  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
010476  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
010502  005077  172316                  CLR     @SR0            ;INITIALIZE SR0
010506  004767  011576                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
010512  012777  010560  172314          MOV     #RET22,@KTVEC   ;SETUP ABORT RETURN
010520  005077  172312                  CLR     @KTSTA
010524  012767  125252  172660          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
010532  005003                          CLR     R3              ;CLEAR REGISTER TO SAVE WHAT WAS READ
                                                                ;ALLOWS CHECKING TO SEE THAT THE
                                                                ;INSTRUCTION DIDN'T COMPLETE
010534  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
010540  012777  001001  172256          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
010546  012103          AD22:   MOV     (R1)+,R3        ;DATI TO NR PAGE - SHOULD ABORT
010550  105077  172250                  CLRB    @SR0            ;IF NO ABORT, TURN OFF KT11-C
010554  104006                          HLT                     ;DATI TO NR PAGE WITH MEMORY
010556  000445                          BR      DONE22          ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                                ;CAUSE AN ABORT
010560  017702  172240          RET22:  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
010564  005377  172234                  DEC     @SR0            ;TURN OFF KT11-C
010570  022702  101023                  CMP     #101023,R2      ;CHECK SAVED CONTENTS OF SR0
010574  001401                          BEQ     .+4
010576  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED ON NR
                                                                ;REFERENCE TO DATA SPACE, KERNEL PAGE 1
010600  022777  000021  172220          CMP     #21,@SR1        ;CHECK SR1
010606  001401                          BEQ     .+4
010610  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED ON THE
                                                                ;NR REFERENCE WHICH AUTO INCREMENTED R1 BY ONE
010612  022777  010546  172210          CMP     #AD22,@SR2      ;CHECK SR2
010620  001401                          BEQ     .+4
010622  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE NR REFERENCE
010624  017704  172412                  MOV     @KIPDR1,R4      ;MOVE CONTENTS OF KIPDR1 TO R4
010630  042704  000007                  BIC     #7,R4           ;TO MASK OFF THE ACCESS KEY
010634  022704  077400                  CMP     #77400,R4       ;CHECK INSTRUCTION SPACE PDR
010640  001401                          BEQ     .+4             ;(BITS 0-2 MASKED OUT)
010642  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
010644  017705  172412                  MOV     @KDPDR1,R5      ;MOVE CONTENTS OF KDPDR1 TO R5
010650  042705  000007                  BIC     #7,R5           ;TO MASK OFF THE ACCESS KEY
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010654  022705  077400                  CMP     #77400,R5       ;CHECK DATA SPACE PDR
010660  001401                          BEQ     .+4             ;(BITS 0-2 MASKED OUT)
010662  104006                          HLT                     ;KDPDR1 INCORRECT- SHOULD NOT
                                                                ;HAVE BEEN CHANGED
010664  005703                          TST     R3              ;MAKE SURE INSTRUCTION DIDN'T COMPLETE
010666  001401                          BEQ     .+4
010670  104006                          HLT                     ;THE INSTRUCTION REFERENCING THE NR
                                                                ;PAGE DIDN'T ABORT BEFORE COMPLETING
010672  016777  172140  172134  DONE22: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
010700  005077  172132                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
010704  005077  172114                  CLR     @SR0
010710  005037  177776                  CLR     @#PS

                                        ;SHOW THAT A DATO (NO DATIP) TO A NR PAGE WITHOUT
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING THE DATO
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
010714  104400                  TEST23: SCOPE
010716  012737  000023  177570          MOV     #23,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
010724  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
010730  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
010734  005077  172064                  CLR     @SR0            ;INITIALIZE SR0
010740  004767  011344                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
010744  012777  011012  172062          MOV     #RET23,@KTVEC   ;SETUP ABORT RETURN
010752  005077  172060                  CLR     @KTSTA
010756  005067  172430                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO NR PAGE
010762  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
010766  112777  000001  172030          MOVB    #1,@SR0         ;TURN ON KT11-C
010774  012721  125252          AD23:   MOV     #125252,(R1)+   ;DATO TO NR PAGE-SHOULD ABORT
011000  042777  000001  172016          BIC     #1,@SR0         ;TURN OFF KT11-C
011006  104006                          HLT                     ;DATO TO NR PAGE FAILED TO ABORT
011010  000446                          BR      DONE23
011012  017702  172006          RET23:  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
011016  005377  172002                  DEC     @SR0            ;TURN OFF KT11-C
011022  022702  100023                  CMP     #100023,R2      ;CHECK SAVED CONTENTS OF SR0
011026  001401                          BEQ     .+4
011030  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(NR)
                                                                ;NR FAULT SHOULD BE SET
011032  022777  010427  171766          CMP     #10427,@SR1     ;CHECK SR1
011040  001401                          BEQ     .+4
011042  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH
                                                                ;AUTOINCREMENTED R7 AND THEN R1
011044  022777  010774  171756          CMP     #AD23,@SR2      ;CHECK SR2
011052  001401                          BEQ     .+4
011054  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
011056  017703  172160                  MOV     @KIPDR1,R3      ;MOVE CONTENTS OF KIPDR1 TO R3
011062  042703  000007                  BIC     #7,R3           ;TO MASK OFF THE ACCESS KEY
011066  022703  077400                  CMP     #77400,R3       ;CHECK INSTRUCTION SPACE PDR
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011072  001401                          BEQ     .+4             ;(BITS 0-2 MASKED OUT)
011074  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
011076  017704  172160                  MOV     @KDPDR1,R4      ;MOVE CONTENTS OF KDPDR1 TO R4
011102  042704  000007                  BIC     #7,R4           ;TO MASK OFF THE ACCESS KEY
011106  022704  077400                  CMP     #77400,R4       ;CHECK DATA SPACE PDR
011112  001401                          BEQ     .+4             ;(BITS 0-2 MASKED OUT)
011114  104006                          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
011116  005767  172270                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
011122  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
011124  104006                          HLT                     ;DATO TO NR PAGE WROTE
                                                                ;INTO THE DESTINATION LOCATION
011126  016777  171704  171700  DONE23: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
011134  005077  171676                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
011140  005077  171660                  CLR     @SR0
011144  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATO (NO DATIP) TO A NR PAGE WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
011150  104400                  TEST24: SCOPE
011152  012737  000024  177570          MOV     #24,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
011160  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
011164  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
011170  005077  171630                  CLR     @SR0            ;INITIALIZE SR0
011174  004767  011110                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
011200  012777  011244  171626          MOV     #RET24,@KTVEC   ;SETUP ABORT RETURN
011206  005077  171624                  CLR     @KTSTA
011212  005067  172174                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO NR PAGE
011216  012702  023412                  MOV     #DESTAD+20000,R2        ;R2 CONTAINS ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
011222  012777  001001  171574          MOV     #1001,@SR0      ;TURN ON KT11-C, MMGT TRAP ENABLE
011230  012722  125252          AD24:   MOV     #125252,(R2)+   ;DATO TO NR PAGE-SHOULD ABORT
011234  105377  171564                  DECB    @SR0            ;TURN OFF KT11-C
011240  104006                          HLT                     ;DATO TO NR PAGE FAILED TO ABORT
011242  000446                          BR      DONE24
011244  017701  171554          RET24:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
011250  005377  171550                  DEC     @SR0            ;TURN OFF KT11-C
011254  022701  101023                  CMP     #101023,R1      ;CHECK SAVED CONTENTS OF SR0
011260  001401                          BEQ     .+4
011262  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(NR)
                                                                ;AND NR FAULT SHOULD BE SET
011264  022777  011027  171534          CMP     #11027,@SR1     ;CHECK SR1
011272  001401                          BEQ     .+4
011274  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                ;INCREMENTED R7 AND THEN R2
011276  022777  011230  171524          CMP     #AD24,@SR2      ;CHECK SR2
011304  001401                          BEQ     .+4
011306  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
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                                                        ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
011310  017703  171726                MOV     @KIPDR1,R3      ;MOVE CONTENTS OF I-SPACE PDR TO R3
011314  042703  000007                BIC     #7,R3           ;TO MASK OFF THE ACCESS KEY
011320  022703  077400                CMP     #77400,R3       ;CHECK INSTRUCTION SPACE PDR
011324  001401                        BEQ     .+4             ;WITH BITS 0-2 MASKED OUT
011326  104006                        HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                        ;HAVE BEEN CHANGED
011330  017704  171726                MOV     @KDPDR1,R4      ;MOVE CONTENTS OF D-SPACE PDR TO R4
011334  042704  000007                BIC     #7,R4           ;TO MASK OFF ACCESS KEY
011340  022704  077400                CMP     #77400,R4       ;CHECK DATA SPACE PDR
011344  001401                        BEQ     .+4             ;WITH BITS 0-2 MASKED OFF
011346  104006                        HLT                     ;KDPDR1 INCORRECT-SHOULD NOT
                                                        ;HAVE BEEN CHANGED
011350  005767  172036                TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
011354  001401                        BEQ     .+4             ;LOCATION WAS NOT WRITTEN
011356  104006                        HLT                     ;DATO TO NR PAGE WROTE
                                                        ;INTO THE DESTINATION LOCATION
011360  016777  171452  171446 DONE24: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
011366  005077  171444                CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
011372  005077  171426                CLR     @SR0
011376  005037  177776                CLR     @#PS


                                        ;SHOW THAT A DATIP, DATO SEQUENCE TO A NR PAGE WITHOUT
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
011402  104400                TEST25: SCOPE
011404  012737  000025  177570        MOV     #25,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
011412  005037  177776                CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
011416  012706  001000                MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
011422  005077  171376                CLR     @SR0            ;INITIALIZE SR0
011426  004767  010656                JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR,BANK 0
                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
011432  012777  011476  171374        MOV     #RET25,@KTVEC   ;SETUP ABORT RETURN
011440  005077  171372                CLR     @KTSTA
011444  005067  171742                CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                        ;BY DATIP,DATO TO NR PAGE
011450  012703  023414                MOV     #DESTAD+20002,R3        ;R3 CONTAINS ADDRESS+2 OF LOCATION
                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
011454  052777  000001  171342        BIS     #1,@SR0 ;TURN ON KT11-C
011462  005243                AD25:   INC     -(R3)           ;DATIP, DATO TO NR PAGE-SHOULD ABORT
011464  042777  000001  171332        BIC     #1,@SR0         ;TURN OFF KT11-C
011472  104006                        HLT                     ;DATIP, DATO TO NR PAGE FAILED TO
011474  000447                        BR      DONE25          ;ABORT
011476  017701  171322        RET25:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
011502  042777  000001  171314        BIC     #1,@SR0         ;TURN OFF KT11-C
011510  022701  100023                CMP     #100023,R1      ;CHECK SAVED CONTENTS OF SR0
011514  001401                        BEQ     .+4
011516  104006                        HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON DATO TO KERNEL DATA PAGE 1(NR)
                                                        ;NR FAULT SHOULD BE SET
011520  022777  000363  171300        CMP     #363,@SR1       ;CHECK SR1
011526  001401                        BEQ     .+4
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011530  104006                          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH
                                                                ;AUTODECREMENTED R3 BY TWO
011532  022777  011462  171270          CMP     #AD25,@SR2      ;CHECK SR2
011540  001401                          BEQ     .+4
011542  104006                          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
011544  017704  171472                  MOV     @KIPDR1,R4      ;MOVE CONTENTS OF I-SPACE PDR TO R4
011550  042704  000007                  BIC     #7,R4           ;TO MASK OFF THE ACCESS KEY
011554  022704  077400                  CMP     #77400,R4       ;CHECK INSTRUCTION SPACE PDR
011560  001401                          BEQ     .+4             ;WITH BITS 0-2 MASKED OFF
011562  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
011564  017705  171472                  MOV     @KDPDR1,R5      ;MOVE CONTENTS OF D-SPACE PDR TO R5
011570  042705  000007                  BIC     #7,R5           ;TO MASK OFF THE ACCESS KEY
011574  022705  077400                  CMP     #77400,R5       ;CHECK DATA SPACE PDR
011600  001401                          BEQ     .+4             ;WITH BITS 0-2 MASKED OFF
011602  104006                          HLT                     ;KDPDR1 INCORRECT- SHOULD NOT HAVE
                                                                ;BEEN CHANGED
011604  005767  171602                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
011610  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
011612  104006                          HLT                     ;DATO TO NR PAGE WROTE INTO
                                                                ;THE DESTINATION LOCATION
011614  016777  171216  171212  DONE25: MOV     KTSTA,@KTVEC    ;CHANGE PAGE FAULT RETURN
011622  005077  171210                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED
011626  005077  171172                  CLR     @SR0            ;TRAP
011632  005037  177776                  CLR     @#PS

                                        ;SHOW THAT A DATIP, DATO SEQUENCE TO A NR PAGE WITH
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
011636  104400                  TEST26: SCOPE
011640  012737  000026  177570          MOV     #26,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
011646  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
011652  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
011656  005077  171142                  CLR     @SR0            ;INITIALIZE SR0
011662  004767  010422                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR,BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
011666  012777  011732  171140          MOV     #RET26,@KTVEC   ;SETUP ABORT RETURN
011674  005077  171136                  CLR     @KTSTA
011700  005067  171506                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATO TO NR PAGE
011704  012703  023414                  MOV     #DESTAD+20002,R3        ;R3 CONTAINS ADDRESS+2 OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
011710  052777  001001  171106          BIS     #1001,@SR0      ;TURN ON KT11-C
011716  005243                  AD26:   INC     -(R3)           ;DATIP, DATO TO NR PAGE-SHOULD ABORT
011720  042777  000001  171076          BIC     #1,@SR0         ;TURN OFF KT11-C
011726  104006                          HLT                     ;DATIP, DATO TO NR PAGE FAILED TO
011730  000447                          BR      DONE26          ;ABORT
011732  017701  171066          RET26:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
011736  042777  000001  171060          BIC     #1,@SR0         ;TURN OFF KT11-C
011744  022701  101023                  CMP     #101023,R1      ;CHECK SAVED CONTENTS OF SR0
011750  001401                          BEQ     .+4
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011752  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON DATO TO KERNEL DATA PAGE 1(NR)
                                                                ;NR FAULT SHOULD BE SET
011754  022777  000363  171044          CMP     #363,@SR1       ;CHECK SR1
011762  001401                          BEQ     .+4
011764  104006                          HLT
                                                                ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, WHICH
                                                                ;AUTODECREMENTED R3 BY TWO
011766  022777  011716  171034          CMP     #AD26,@SR2      ;CHECK SR2
011774  001401                          BEQ     .+4
011776  104006                          HLT
                                                                ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                                                ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
012000  017704  171236                  MOV     @KIPDR1,R4      ;MOVE CONTENTS OF I-SPACE PDR TO R4
012004  042704  000007                  BIC     #7,R4           ;TO MASK OFF THE ACCESS KEY
012010  022704  077400                  CMP     #77400,R4       ;CHECK INSTRUCTION SPACE PDR
012014  001401                          BEQ     .+4             ;WITH BITS 0-2 MASKED OFF
012016  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED
012020  017705  171236                  MOV     @KDPDR1,R5      ;MOVE CONTENTS OF D-SPACE PDR TO R5
012024  042705  000007                  BIC     #7,R5           ;TO MASK OFF THE ACCESS KEY
012030  022705  077400                  CMP     #77400,R5       ;CHECK DATA SPACE PDR
012034  001401                          BEQ     .+4             ;WITH BITS 0-2 MASKED OFF
012036  104006                          HLT                     ;KDPDR1 INCORRECT- SHOULD NOT HAVE
                                                                ;BEEN CHANGED
012040  005767  171346                  TST     DESTAD          ;MAKE CERTAIN THAT DESTINATION
012044  001401                          BEQ     .+4             ;LOCATION WAS NOT WRITTEN
012046  104006                          HLT                     ;DATO TO NR PAGE WROTE INTO
                                                                ;THE DESTINATION LOCATION
012050  016777  170762  170756  DONE26: MOV     KTSTA,@KTVEC    ;CHANGE PAGE FAULT RETURN
012056  005077  170754                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED
012062  005077  170736                  CLR     @SR0            ;TRAP
012066  005037  177776                  CLR     @#PS


                                        ;SHOW THAT A DATIP,DATOB SEQUENCE TO A NR PAGE WITHOUT
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
012072  104400                  TEST27: SCOPE
012074  012737  000027  177570          MOV     #27,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
012102  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
012106  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
012112  005077  170706                  CLR     @SR0            ;INITIALIZE SR0
012116  004767  010166                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
012122  012777  012164  170704          MOV     #RET27,@KTVEC   ;SETUP ABORT RETURN
012130  005077  170702                  CLR     @KTSTA
012134  005067  171252                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATOB TO NR PAGE
012140  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 1
012144  052777  000001  170652          BIS     #1,@SR0 ;TURN ON KT11-C
012152  105224          AD27:   INCB    (R4)+           ;DATIP, DATOB TO NR PAGE-SHOULD ABORT
012154  005377  170644                  DEC     @SR0            ;TURN OFF KT11-C
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012160  104006                          HLT             ;DATIP,DATO TO NR PAGE FAILED
012162  000446                          BR      DONE27  ;TO ABORT
012164  017701  170634        RET27:    MOV     @SR0,R1 ;SAVE CONTENTS OF SR0
012170  005377  170630                  DEC     @SR0    ;TURN OFF KT11-C
012174  022701  100023                  CMP     #100023,R1 ;CHECK SAVED CONTENTS OF SR0
012200  001401                          BEQ     .+4
012202  104006                          HLT             ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
                                                        ;DATIP, DATOB TO KERNEL DATA PAGE 1 (NR)
                                                        ;NR FAULT SHOULD BE SET
012204  022777  000014  170614          CMP     #14,@SR1 ;CHECK SR1
012212  001401                          BEQ     .+4
012214  104006                          HLT             ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                        ;INCREMENTED R4 BY ONE
012216  022777  012152  170604          CMP     #AD27,@SR2 ;CHECK SR2
012224  001401                          BEQ     .+4
012226  104006                          HLT             ;SR2 INCORRECT SHOULD HAVE LOCKED
                                                        ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
012230  017702  171006                  MOV     @KIPDR1,R2 ;MOVE CONTENTS OF I-SPACE PDR 1 TO R2
012234  042702  000007                  BIC     #7,R2   ;TO MASK OFF THE ACCESS KEY
012240  022702  077400                  CMP     #77400,R2 ;CHECK INSTRUCTION SPACE PDR
012244  001401                          BEQ     .+4     ;WITH BITS 0-2 MASKED OFF
012246  104006                          HLT             ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED
012250  017703  171006                  MOV     @KDPDR1,R3 ;MOVE CONTENTS OF D-SPACE PDR TO R3
012254  042703  000007                  BIC     #7,R3   ;TO MASK OFF THE ACCESS KEY
012260  022703  077400                  CMP     #77400,R3 ;CHECK DATA SPACE PDR
012264  001401                          BEQ     .+4     ;WITH BITS 0-2 MASKED OFF
012266  104006                          HLT             ;KDPDR1 INCORRECT- SHOULD NOT
                                                        ;HAVE BEEN CHANGED
012270  005767  171116                  TST     DESTAD  ;MAKE CERTAIN THAT DESTINATION
012274  001401                          BEQ     .+4     ;LOCATION WAS NOT WRITTEN
012276  104006                          HLT             ;DATOB TO NR PAGE WROTE INTO
                                                        ;THE DESTINATION LOCATION
012300  016777  170532  170526  DONE27: MOV     KTSTA,@KTVEC ;CHANGE KT11-C FAULT
012306  005077  170524                  CLR     @KTSTA  ;RETURN TO CAUSE A HALT ON AN
012312  005077  170506                  CLR     @SR0    ;UNEXPECTED TRAP
012316  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATIP,DATOB SEQUENCE TO A NR PAGE WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
012322  104400                  TEST30: SCOPE
012324  012737  000030  177570          MOV     #30,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
012332  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
012336  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
012342  005077  170456                  CLR     @SR0            ;INITIALIZE SR0
012346  004767  007736                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 NR, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
012352  012777  012414  170454          MOV     #RET30,@KTVEC   ;SETUP ABORT RETURN
012360  005077  170452                  CLR     @KTSTA
012364  005067  171022                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATIP,DATOB TO NR PAGE
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012370  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS ADDRESS OF LOCATION
                                                                        ;TO BE REFERENCED THRU KERNEL PAGE 1
012374  052777  001001  170422          BIS     #1001,@SR0              ;TURN ON KT11-C
012402  105224                  AD30:   INCB    (R4)+                   ;DATIP, DATOB TO NR PAGE-SHOULD ABORT
012404  005377  170414                  DEC     @SR0                    ;TURN OFF KT11-C
012410  104006                          HLT                             ;DATIP,DATO TO NR PAGE FAILED
012412  000446                          BR      DONE30                  ;TO ABORT
012414  017701  170404          RE"30:  MOV     @SR0,R1                 ;SAVE CONTENTS OF SR0
012420  005377  170400                  DEC     @SR0                    ;TURN OFF KT11-C
012424  022701  101023                  CMP     #101023,R1              ;CHECK SAVED CONTENTS OF SR0
012430  001401                          BEQ     .+4
012432  104006                          HLT                             ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
                                                                        ;DATIP, DATOB TO KERNEL DATA PAGE 1 (NR)
                                                                        ;NR FAULT SHOULD BE SET
012434  022777  000014  170364          CMP     #14,@SR1                ;CHECK SR1
012442  001401                          BEQ     .+4
012444  104006                          HLT                             ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                                                        ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                                                        ;INCREMENTED R4 BY ONE
012446  022777  012402  170354          CMP     #AD30,@SR2              ;CHECK SR2
012454  001401                          BEQ     .+4
012456  104006                          HLT                             ;SR2 INCORRECT SHOULD HAVE LOCKED
                                                                        ;ON THE ABORTED REFERENCE, CONTAINING THE
                                                                        ;VIRTUAL ADDRESS OF THE INSTRUCTION
012460  017702  170556                  MOV     @KIPDR1,R2              ;MOVE CONTENTS OF I-SPACE PDR 1 TO R2
012464  042702  000007                  BIC     #7,R2                   ;TO MASK OFF THE ACCESS KEY
012470  022702  077400                  CMP     #77400,R2               ;CHECK INSTRUCTION SPACE PDR
012474  001401                          BEQ     .+4                     ;WITH BITS 0-2 MASKED OFF
012476  104006                          HLT                             ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                                        ;BEEN CHANGED
012500  017703  170556                  MOV     @KDPDR1,R3              ;MOVE CONTENTS OF D-SPACE PDR TO R3
012504  042703  000007                  BIC     #7,R3                   ;TO MASK OFF THE ACCESS KEY
012510  022703  077400                  CMP     #77400,R3               ;CHECK DATA SPACE PDR
012514  001401                          BEQ     .+4                     ;WITH BITS 0-2 MASKED OFF
012516  104006                          HLT                             ;KDPDR1 INCORRECT- SHOULD NOT
                                                                        ;HAVE BEEN CHANGED
012520  005767  170666                  TST     DESTAD                  ;MAKE CERTAIN THAT DESTINATION
012524  001401                          BEQ     .+4                     ;LOCATION WAS NOT WRITTEN
012526  104006                          HLT                             ;DATOB TO NR PAGE WROTE INTO
                                                                        ;THE DESTINATION LOCATION
012530  016777  170302  170276  DONE30: MOV     KTSTA,@KTVEC            ;CHANGE KT11-C FAULT
012536  005077  170274                  CLR     @KTSTA                  ;RETURN TO CAUSE A HALT ON AN
012542  005077  170256                  CLR     @SR0                    ;UNEXPECTED TRAP
012546  005037  177776                  CLR     @#PS

012552  104400                          SCOPE
012554  005267  170622                  INC     NRCNT                   ;COUNT HOW MANY NR KEYS HAVE BEEN TESTED
012560  022767  000003  170614          CMP     #3,NRCNT
012566  001413                          BEQ     NXTST                   ;IF ALL 3 HAVE BEEN TESTED, BRANCH
012570  016701  170606                  MOV     NRCNT,R1                ;OTHERWISE, CALCULATE OFFSET TO GET NEXT KEY
012574  006301                          ASL     R1
012576  016137  003404  001000          MOV     NRKEYS(R1),@#KSTACK     ;PUT NEXT NR KEY ON STACK
012604  012767  010234  010006          MOV     #TEST21+6,RETURN        ;PUT NEW SCOPE LOOP ADDRESS IN RETURN
012612  000167  175416                  JMP     TEST21+6                ;JUMP TO EXECUTE TESTS WITH NEXT NR KEY
012616  005067  170560          NXTST:  CLR     NRCNT
012622  012767  012632  007770          MOV     #TEST31+2,RETURN
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                                        ;SHOW THAT DATI TO A RW PAGE (ACF=6) WITHOUT MEMORY
                                        ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
012630  104400                  TEST31: SCOPE
012632  012737  000031  177570          MOV     #31,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
012640  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
012644  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
012650  005077  170150                  CLR     @SR0            ;INITIALIZE SR0
012654  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
012660  004767  007424                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
012664  005726                          TST     (SP)+           ;RESTORE STACK POINTER
012666  012777  013026  170140          MOV     #RET31,@KTVEC   ;SETUP ABORT RETURN IN CASE
012674  005077  170136                  CLR     @KTSTA
012700  012767  125252  170504          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
012706  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
012712  005277  170106                  INC     @SR0            ;TURN ON KT11-C
012716  022721  125252                  CMP     #125252,(R1)+   ;DATI TO RW PAGE-SHOULDN'T TRAP OR ABORT
012722  001404                          BEQ     OK31
012724  005377  170074                  DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
012730  104006                          HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 1
012732  000441                          BR      DONE31
012734  017702  170064          OK31:   MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
012740  105377  170060                  DECB    @SR0            ;TURN OFF KT11-C
012744  022702  000021                  CMP     #21,R2          ;CHECK SAVED CONTENTS OF SR0
012750  001401                          BEQ     .+4
012752  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0 TO TURN OFF KT11-C
012754  022777  000027  170044          CMP     #27,@SR1        ;CHECK SR1
012762  001401                          BEQ     .+4
012764  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
012766  022777  012766  170034          CMP     #.,@SR2         ;CHECK SR2
012774  001401                          BEQ     .+4
012776  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
013000  022777  077406  170234          CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
013006  001401                          BEQ     .+4             ;THE RW PAGE REFERENCED
013010  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
013012  022777  077406  170242          CMP     #77406,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
013020  001401                          BEQ     .+4             ;TO THE RW REFERENCE
013022  104006                          HLT                     ;KDPDR1 INCORRECT - SHOULD NOT
                                                                ;HAVE BEEN CHANGED
013024  000404                          BR      DONE31
013026  042777  000001  167770  RET31:  BIC     #1,@SR0         ;TURN OFF KT11-C
013034  104006                          HLT                     ;DATI TO RW PAGE CAUSED
                                                                ;A TRAP OR ABORT
013036  016777  167774  167770  DONE31: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
013044  005077  167766                  CLR     @KTSTA          ;OR AN UNEXPECTED TRAP
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013050  005077  167750                CLR     @SR0            ;INITIALIZE SR0
013054  005037  177776                CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATI TO A RW PAGE (ACF=6) WITH MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
013060  104400                TEST32: SCOPE
013062  012737  000032  177570        MOV     #32,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
013070  005037  177776                CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
013074  012706  001000                MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
013100  005077  167720                CLR     @SR0            ;INITIALIZE SR0
013104  012746  000006                MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
013110  004767  007174                JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                              ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                              ;MAKE ALL OTHER PAGES RW, BANK 0
013114  005726                       TST     (SP)+           ;RESTORE STACK POINTER
013116  012777  013260  167710        MOV     #RET32,@KTVEC   ;SETUP ABORT RETURN IN CASE
013124  005077  167706                CLR     @KTSTA
013130  012767  125252  170254        MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
013136  012701  023412                MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                              ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
013142  052777  001001  167654        BIS     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
013150  022721  125252                CMP     #125252,(R1)+   ;DATI TO RW PAGE-SHOULDN'T TRAP OR ABORT
013154  001404                        BEQ     OK32
013156  005377  167642                DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
013162  104006                        HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 1
013164  000441                        BR      DONE32
013166  017702  167632        OK32:   MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
013172  105377  167626                DECB    @SR0            ;TURN OFF KT11-C
013176  022702  001021                CMP     #1021,R2        ;CHECK SAVED CONTENTS OF SR0
013202  001401                        BEQ     .+4
013204  104006                        HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                              ;TRACKED REFERENCE TO KERNEL DATA SPACE,
                                                              ;PAGE 0, WHICH GOT THE ADDRESS
                                                              ;OF SR0 AND MMGT TRAP ENABLE SHOULD BE SET
013206  022777  000027  167612        CMP     #27,@SR1        ;CHECK SR1
013214  001401                        BEQ     .+4
013216  104006                        HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                              ;TRACKING EVEN WITH KT11-C
013220  022777  013220  167602        CMP     #.,@SR2         ;CHECK SR2
013226  001401                        BEQ     .+4
013230  104006                        HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                              ;WHEN KT11-C IS OFF
013232  022777  077406  170002        CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
013240  001401                        BEQ     .+4             ;THE RW PAGE REFERENCED
013242  104006                        HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                              ;HAVE BEEN CHANGED
013244  022777  077406  170010        CMP     #77406,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
013252  001401                        BEQ     .+4             ;TO THE RW REFERENCE
013254  104006                        HLT                     ;KDPDR1 INCORRECT - SHOULD NOT
                                                              ;HAVE BEEN CHANGED
013256  000404                        BR      DONE32
013260  042777  000001  167536 RET32: BIC     #1,@SR0         ;TURN OFF KT11-C
013266  104006                        HLT                     ;DATI TO RW PAGE CAUSED
                                                              ;A TRAP OR ABORT
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013270  016777  167542  167536  DONE32: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
013276  005077  167534                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
013302  005077  167516                  CLR     @SR0            ;INITIALIZE SR0
013306  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATC (NO DATIP) TO A RW PAGE (ACF=6) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
013312  104400          TEST33: SCOPE
013314  012737  000033  177570          MOV     #33,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
013322  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
013326  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
013332  005077  167466                  CLR     @SR0            ;INITIALIZE SR0
013336  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON THE STACK
013342  004767  006742                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
013346  005726                          TST     (SP)+           ;RESTORE STACK POINTER
013350  012777  013506  167456          MOV     #RET33,@KTVEC   ;SETUP ABORT RETURN IN CASE
013356  005077  167454                  CLR     @KTSTA
013362  005067  170024                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE REFERENCED
013366  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
013372  005277  167426                  INC     @SR0            ;TURN ON KT11-C
013376  012721  125252                  MOV     #125252,(R1)+   ;DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
013402  017702  167416                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
013406  105377  167412                  DECB    @SR0            ;TURN OFF KT11-C
013412  022702  000021                  CMP     #21,R2          ;CHECK SAVED CONTENTS OF SR0
013416  001401                          BEQ     .+4
013420  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0 TO TURN OFF KT11-C
013422  022777  000027  167376          CMP     #27,@SR1        ;CHECK SR1
013430  001401                          BEQ     .+4
013432  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
013434  022777  013434  167366          CMP     #.,@SR2         ;CHECK SR2
013442  001401                          BEQ     .+4
013444  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
013446  022777  077406  167566          CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
013454  001401                          BEQ     .+4             ;THE RW PAGE REFERENCED
013456  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
013460  022777  077506  167574          CMP     #77506,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
013466  001401                          BEQ     .+4             ;TO THE RW REFERENCE
013470  104006                          HLT                     ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                                                ;BE SET SINCE PAGE WAS WRITTEN INTO
013472  022767  125252  167712          CMP     #125252,DESTAD  ;MAKE SURE THAT THE WRITE ACTUALLY OCCURRED
013500  001401                          BEQ     .+4
013502  104006                          HLT                     ;DATO TO RW PAGE FAILED TO WRITE CORRECT LOCATION
013504  000404                          BR      DONE33
013506  042777  000001  167310  RET33:  BIC     #1,@SR0         ;TURN OFF KT11-C
013514  104006                          HLT                     ;DATO TO RW PAGE CAUSED
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                                                        ;A TRAP OR ABORT
013516  016777  167314  167310  DONE33: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
013524  005077  167306                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
013530  005077  167270                  CLR     @SR0            ;INITIALIZE SR0
013534  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS


                                ;SHOW THAT A DATO (NO DATIP) TO A RW PAGE (ACF=6) WITH MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
013540  104400                  TEST34: SCOPE
013542  012737  000034  177570          MOV     #34,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
013550  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
013554  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
013560  005077  167240                  CLR     @SR0            ;INITIALIZE SR0
013564  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
013570  004767  006514                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
013574  005726                          TST     (SP)+           ;RESTORE STACK POINTER
013576  012777  013736  167230          MOV     #RET34,@KTVEC   ;SETUP ABORT RETURN IN CASE
013604  005077  167226                  CLR     @KTSTA
013610  005067  167576                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE WRITTEN INTO
013614  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
013620  012777  001001  167176          MOV     #1001,@SR0      ;TURN ON KT11-C, MMGT TRAP ENABLE SET
013626  012721  125252                  MOV     #125252,(R1)+   ;DATO TO RW PAGE-SHOULD NOT TRAP OR ABORT
013632  017702  167166                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
013636  105377  167162                  DECB    @SR0            ;TURN OFF KT11-C
013642  022702  001021                  CMP     #1021,R2        ;CHECK SAVED CONTENTS OF SR0
013646  001401                          BEQ     .+4
013650  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0, AND MMGT TRAP ENABLE SHOULD BE SET
013652  022777  000027  167146          CMP     #27,@SR1        ;CHECK SR1
013660  001401                          BEQ     .+4
013662  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
013664  022777  013664  167136          CMP     #.,@SR2         ;CHECK SR2
013672  001401                          BEQ     .+4
013674  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
013676  022777  077406  167336          CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
013704  001401                          BEQ     .+4             ;THE RW PAGE REFERENCED
013706  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
013710  022777  077506  167344          CMP     #77506,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
013716  001401                          BEQ     .+4             ;TO THE RW REFERENCE
013720  104006                          HLT                     ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                                                ;HAVE SET
013722  022767  125252  167462          CMP     #125252,DESTAD  ;MAKE SURE THAT THE WRITE ACTUALLY OCCURRED
013730  001401                          BEQ     .+4
013732  104006                          HLT                     ;DATO TO RW PAGE FAILED TO WRITE CORRECT LOCATION
013734  000404                          BR      DONE34
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013736  042777  000001  167060  RET34:  BIC     #1,@SR0         ;TURN OFF KT11-C
013744  104006                  HLT                             ;DATO TO RW PAGE CAUSED
                                                                ;A TRAP OR ABORT
013746  016777  167064  167060  DONE34: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
013754  005077  167056          CLR     @KTSTA                  ;ON AN UNEXPECTED TRAP
013760  005077  167040          CLR     @SR0                    ;INITIALIZE SR0
013764  005037  177776          CLR     @#PS                    ;INITIALIZE PROCESSOR STATUS


                                ;SHOW THAT A DATIP, DATO SEQUENCE TO A RW PAGE (ACF=6) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
013770  104400                  TEST35: SCOPE
013772  012737  000035  177570          MOV     #35,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
014000  005037  177776          CLR     @#PS                    ;INITIALIZE PROCESSOR STATUS
014004  012706  001000          MOV     #KSTACK,SP              ;INITIALIZE KERNEL STACK POINTER
014010  005077  167010          CLR     @SR0                    ;INITIALIZE SR0
014014  012746  000006          MOV     #6,-(SP)                        ;PUSH RW KEY ON THE STACK
014020  004767  006264          JSR     %7,SETUP                ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
014024  005726                  TST     (SP)+                   ;RESTORE STACK POINTER
014026  012777  014162  167000  MOV     #RET35,@KTVEC           ;SETUP ABORT RETURN IN CASE
014034  005077  166776          CLR     @KTSTA
014040  005067  167346          CLR     DESTAD                  ;INITIALIZE LOCATION TO BE REFERENCED
014044  012704  023414          MOV     #DESTAD+20002,R4                ;R4 CONTAINS VIRTUAL ADDRESS+2 OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014050  005277  166750          INC     @SR0                    ;TURN ON KT11-C
014054  005244                  INC     -(R4)                   ;DATIP, DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
014056  017702  166742          MOV     @SR0,R2                 ;SAVE CONTENTS OF SR0
014062  105077  166736          CLRB    @SR0                    ;TURN OFF KT11-C
014066  022702  000021          CMP     #21,R2                  ;CHECK SAVED CONTENTS OF SR0
014072  001401                  BEQ     .+4
014074  104006                  HLT                             ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0 TO TURN OFF KT11-C
014076  022777  000027  166722  CMP     #27,@SR1                ;CHECK SR1
014104  001401                  BEQ     .+4
014106  104006                  HLT                             ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
014110  022777  014110  166712  CMP     #.,@SR2                 ;CHECK SR2
014116  001401                  BEQ     .+4
014120  104006                  HLT                             ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
014122  022777  077406  167112  CMP     #77406,@KIPDR1          ;CHECK INSTRUCTION SPACE PDR FOR
014130  001401                  BEQ     .+4                     ;THE RW PAGE REFERENCED
014132  104006                  HLT                             ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
014134  022777  077506  167120  CMP     #77506,@KDPDR1          ;CHECK DATA SPACE PDR CORRESPONDING
014142  001401                  BEQ     .+4                     ;TO THE RW REFERENCE
014144  104006                  HLT                             ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                                                ;HAVE BEEN SET
014146  022767  000001  167236  CMP     #1,DESTAD               ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
014154  001401                  BEQ     .+4
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014156  104006                          HLT                     ;DATIP, DATO TO RW PAGE DIDN'T EXECUTE CORRECTLY
014160  000404                          BR      DONE35
014162  042777  000001  166634  RET35:  BIC     #1,@SR0         ;TURN OFF KT11-C
014170  104006                          HLT                     ;DATIP, DATO TO RW PAGE CAUSED
                                                                ;A TRAP OR ABORT
014172  016777  166640  166634  DONE35: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
014200  005077  166632                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
014204  005077  166614                  CLR     @SR0            ;INITIALIZE SR0
014210  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS


                                ;SHOW THAT DATIP, DATO SEQUENCE TO A RW PAGE (ACF=6) WITH MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
014214  104400                  TEST36: SCOPE
014216  012737  000036  177570          MOV     #36,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
014224  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
014230  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
014234  005077  166564                  CLR     @SR0            ;INITIALIZE SR0
014240  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON THE STACK
014244  004767  006040                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
014250  005726                          TST     (SP)+           ;RESTORE STACK POINTER
014252  012777  014412  166554          MOV     #RET36,@KTVEC   ;SETUP ABORT RETURN IN CASE
014260  005077  166552                  CLR     @KTSTA
014264  005067  167122                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE REFERENCED
014270  012705  023414                  MOV     #DESTAD+20002,R5        ;R5 CONTAINS VIRTUAL ADDRESS+2 OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014274  012777  001001  166522          MOV     #1001,@SR0      ;TURN ON KT11-C, MMGT TRAP ENABLE SET
014302  005245                          INC     -(R5)           ;DATIP, DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
014304  017702  166514                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
014310  042777  000001  166506          BIC     #1,@SR0         ;TURN OFF KT11-C
014316  022702  001021                  CMP     #1021,R2        ;CHECK SAVED CONTENTS OF SR0
014322  001401                          BEQ     .+4
014324  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0, AND MMGT TRAP ENABLE SHOULD BE SET
014326  022777  000027  166472          CMP     #27,@SR1        ;CHECK SR1
014334  001401                          BEQ     .+4
014336  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
014340  022777  014340  166462          CMP     #.,@SR2         ;CHECK SR2
014346  001401                          BEQ     .+4
014350  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
014352  022777  077406  166662          CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
014360  001401                          BEQ     .+4             ;THE RW PAGE REFERENCED
014362  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
014364  022777  077506  166670          CMP     #77506,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
014372  001401                          BEQ     .+4             ;TO THE RW REFERENCE
014374  104006                          HLT                     ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                                                ;HAVE BEEN SET
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014376  022767  000001  167006          CMP     #1,DESTAD       ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
014404  001401                          BEQ     .+4
014406  104006                          HLT                     ;DATIP, DATO TO RW PAGE DIDN'T EXECUTE CORRECTLY
014410  000404                          BR      DONE36
014412  042777  000001  166404  RET36:  BIC     #1,@SR0         ;TURN OFF KT11-C
014420  104006                          HLT                     ;DATIP,DATO TO RW PAGE CAUSED
                                                                ;A TRAP OR ABORT
014422  016777  166410  166404  DONE36: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
014430  005077  166402                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
014434  005077  166364                  CLR     @SR0            ;INITIALIZE SR0
014440  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS


                                ;SHOW THAT A DATIP, DATOB SEQUENCE TO A RW PAGE (ACF=6) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
014444  104400                  TEST37: SCOPE
014446  012737  000037  177570          MOV     #37,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
014454  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
014460  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
014464  005077  166334                  CLR     @SR0            ;INITIALIZE SR0
014470  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON THE STACK
014474  004767  005610                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
014500  005726                          TST     (SP)+           ;RESTORE STACK POINTER
014502  012777  014636  166324          MOV     #RET37,@KTVEC   ;SETUP ABORT RETURN IN CASE
014510  005077  166322                  CLR     @KTSTA
014514  005067  166672                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE REFERENCED
014520  012703  023413                  MOV     #DESTAD+20001,R3        ;R3 CONTAINS VIRTUAL ADDRESS+1 OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014524  005277  166274                  INC     @SR0            ;TURN ON KT11-C
014530  105343                          DECB    -(R3)           ;DATIP, DATOB TO RW PAGE-SHOULDN'T TRAP OR ABORT
014532  017702  166266                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
014536  105377  166262                  DECB    @SR0            ;TURN OFF KT11-C
014542  022702  000021                  CMP     #21,R2          ;CHECK SAVED CONTENTS OF SR0
014546  001401                          BEQ     .+4
014550  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0 TO TURN OFF KT11-C
014552  022777  000027  166246          CMP     #27,@SR1        ;CHECK SR1
014560  001401                          BEQ     .+4
014562  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
014564  022777  014564  166236          CMP     #.,@SR2         ;CHECK SR2
014572  001401                          BEQ     .+4
014574  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
014576  022777  077406  166436          CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
014604  001401                          BEQ     .+4             ;THE RW PAGE REFERENCED
014606  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
014610  022777  077506  166444          CMP     #77506,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
014616  001401                          BEQ     .+4             ;TO THE RW REFERENCE
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014620  104006                          HLT                     ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                                                ;HAVE BEEN SET
014622  022767  000377  166562          CMP     #377,DESTAD     ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
014630  001401                          BEQ     .+4
014632  104006                          HLT                     ;DATIP, DATOB TO RW PAGE DIDN'T EXECUTE CORRECTLY
014634  000404                          BR      DONE37
014636  042777  000001  166160  RET37:  BIC     #1,@SR0         ;TURN OFF KT11-C
014644  104006                          HLT                     ;DATIP, DATOB TO RW PAGE CAUSED
                                                                ;A TRAP OR ABORT
014646  016777  166164  166160  DONE37: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
014654  005077  166156                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
014660  005077  166140                  CLR     @SR0            ;INITIALIZE SR0
014664  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS


                                        ;SHOW THAT A DATIP, DATOB SEQUENCE TO A RW PAGE (ACF=6) WITH MEMORY
                                        ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
014670  104400                  TEST40: SCOPE
014672  012737  000040  177570          MOV     #40,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
014700  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
014704  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
014710  005077  166110                  CLR     @SR0            ;INITIALIZE SR0
014714  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON THE STACK
014720  004767  005364                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
014724  005726                          TST     (SP)+           ;RESTORE STACK POINTER
014726  012777  015064  166100          MOV     #RET40,@KTVEC   ;SETUP ABORT RETURN IN CASE
014734  005077  166076                  CLR     @KTSTA
014740  005067  166446                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE REFERENCED
014744  012700  023413                  MOV     #DESTAD+20001,R0        ;R0 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014750  012777  001001  166046          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
014756  105310                          DECB    @R0             ;DATIP, DATOB TO RW PAGE-SHOULDN'T TRAP OR ABORT
014760  017702  166040                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
014764  105377  166034                  DECB    @SR0            ;TURN OFF KT11-C
014770  022702  001021                  CMP     #1021,R2        ;CHECK SAVED CONTENTS OF SR0
014774  001401                          BEQ     .+4
014776  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0, AND MMGT TRAP ENABLE SHOULD BE SET
015000  022777  000027  166020          CMP     #27,@SR1        ;CHECK SR1
015006  001401                          BEQ     .+4
015010  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
015012  022777  015012  166010          CMP     #.,@SR2         ;CHECK SR2
015020  001401                          BEQ     .+4
015022  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
015024  022777  077406  166210          CMP     #77406,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
015032  001401                          BEQ     .+4             ;THE RW PAGE REFERENCED
015034  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
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015036  022777  077506  166216          CMP     #77506,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
015044  001401                          BEQ     .+4             ;TO THE RW REFERENCE
015046  104006                          HLT                     ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                                                ;HAVE BEEN SET
015050  022767  177400  166334          CMP     #177400,DESTAD  ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
015056  001401                          BEQ     .+4
015060  104006                          HLT                     ;DATIP,DATOB TO RW PAGE FAILED TO EXECUTE CORRECTLY
015062  000404                          BR      DONE40
015064  042777  000001  165732  RET40:  BIC     #1,@SR0         ;TURN OFF KT11-C
015072  104006                          HLT                     ;DATIP, DATOB TO RW PAGE CAUSED
                                                                ;A TRAP OR ABORT
015074  016777  165736  165732  DONE40: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
015102  005077  165730                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
015106  005077  165712                  CLR     @SR0            ;INITIALIZE SR0
015112  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT DATI TO A RRWT PAGE (ACF=4) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
015116  104400                  TEST41: SCOPE
015120  012737  000041  177570          MOV     #41,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
015126  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
015132  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
015136  005077  165662                  CLR     @SR0            ;INITIALIZE SR0
015142  012746  000004                  MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
015146  004767  005136                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
015152  005726                          TST     (SP)+           ;RESTORE STACK POINTER
015154  012777  015314  165652          MOV     #RET41,@KTVEC   ;SETUP ABORT RETURN IN CASE
015162  005077  165650                  CLR     @KTSTA
015166  012767  125252  166216          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
015174  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
015200  005277  165620                  INC     @SR0            ;TURN ON KT11-C
015204  022721  125252                  CMP     #125252,(R1)+   ;DATI TO RRWT PAGE-SHOULDN'T TRAP SINCE
                                                                ;TRAP ENABLE ISN'T SET
015210  001404                          BEQ     OK41
015212  005377  165606                  DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
015216  104006                          HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 1
015220  000441                          BR      DONE41
015222  017702  165576          OK41:   MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
015226  105377  165572                  DECB    @SR0            ;TURN OFF KT11-C
015232  022702  010021                  CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
015236  001401                          BEQ     .+4
015240  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0, AND MMGT TRAP SHOULD BE SET
015242  022777  000027  165556          CMP     #27,@SR1        ;CHECK SR1
015250  001401                          BEQ     .+4
015252  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
015254  022777  015254  165546          CMP     #.,@SR2         ;CHECK SR2
015262  001401                          BEQ     .+4
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015264  104006                          HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
015266  022777  077404  165746          CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
015274  001401                          BEQ     .+4             ;THE RRWT PAGE REFERENCED
015276  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE
                                                                ;RRWT REFERENCE WAS TO DATA SPACE
015300  022777  077604  165754          CMP     #77604,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
015306  001401                          BEQ     .+4             ;TO THE RRWT REFERENCE
015310  104006                          HLT                     ;KDPDR1 INCORRECT-"A" BIT SHOULD
                                                                ;BE SET SINCE DATA SPACE WAS READ
                                                                ;AND WAS RRWT
015312  000404                          BR      DONE41
015314  042777  000001  165502  RET41: BIC     #1,@SR0         ;TURN OFF KT11-C
015322  104006                          HLT                     ;DATI TO RRWT PAGE CAUSED
                                                                ;A TRAP OR ABORT ALTHOUGH MEMORY
                                                                ;MANAGEMENT TRAP ENABLE WAS NOT SET
015324  016777  165506  165502  DONE41: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
015332  005077  165500                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
015336  005077  165462                  CLR     @SR0            ;INITIALIZE SR0
015342  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATI TO A RRWT PAGE (ACF=4) WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
015346  104400                  TEST42: SCOPE
015350  012737  000042  177570          MOV     #42,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
015356  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
015362  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
015366  005077  165432                  CLR     @SR0            ;INITIALIZE SR0
015372  012746  000004                  MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
015376  004767  004706                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
015402  005726                          TST     (SP)+           ;RESTORE STACK POINTER
015404  012777  015452  165422          MOV     #RET42,@KTVEC   ;SETUP TRAP RETURN
015412  005077  165420                  CLR     @KTSTA
015416  012767  125252  165766          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
015424  005003                          CLR     R3              ;CLEAR REGISTER TO SAVE WHAT WAS READ
                                                                ;ALLOWS CHECKING TO SEE THAT THE
                                                                ;INSTRUCTION COMPLETED BEFORE
                                                                ;TRAPPING
015426  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
015432  012777  001001  165364          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
015440  012103                          MOV     (R1)+,R3        ;DATI TO RRWT PAGE-SHOULD TRAP
015442  105077  165356                  CLRB    @SR0            ;IF NO TRAP, TURN OFF KT11-C
015446  104006                          HLT                     ;DATI TO RRWT PAGE WITH MEMORY
015450  000440                          BR      DONE42          ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                                ;CAUSE A TRAP
015452  017702  165346          RET42:  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
015456  005377  165342                  DEC     @SR0            ;TURN OFF KT11-C
015462  022702  011021                  CMP     #11021,R2       ;CHECK SAVED CONTENTS OF SR0
015466  001401                          BEQ     .+4
015470  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED
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                                                        ;THE REFERENCE TO DATA SPACE, PAGE
                                                        ;0, WHICH GOT THE ADDRESS OF SR0,
                                                        ;AND MMGT TRAP SHOULD BE SET
015472  022777  000027  165326          CMP     #27,@SR1        ;CHECK SR1
015500  001401                          BEQ     .+4
015502  104006                          HLT
                                                        ;SR1 INCORRECT-SHOULD CONTINUE
                                                        ;TRACKING WITH KT11-C OFF
015504  022777  015504  165316          CMP     #.,@SR2         ;CHECK SR2
015512  001401                          BEQ     .+4
015514  104006                          HLT
                                                        ;SR2 INCORRECT-SHOULD STILL BE
                                                        ;TRACKING EVEN WITH KT11-C OFF
015516  022777  077404  165516          CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
015524  001401                          BEQ     .+4
015526  104006                          HLT
                                                        ;KIPDR1 INCORRECT-SHOULD NOT
                                                        ;HAVE BEEN CHANGED SINCE THE RRWT
                                                        ;REFERENCE WAS TO DATA SPACE
015530  022777  077604  165524          CMP     #77604,@KDPDR1  ;CHECK DATA SPACE PDR
015536  001401                          BEQ     .+4
015540  104006                          HLT
                                                        ;KDPDR1 INCORRECT-"A" BIT SHOULD
                                                        ;BE SET SINCE DATA SPACE WAS RRWT
                                                        ;AND WAS READ
015542  022703  125252                  CMP     #125252,R3      ;CHECK LOCATION WRITTEN INTO
015546  001401                          BEQ     .+4
015550  104006                          HLT
                                                        ;THE INSTRUCTION REFERENCING THE RRWT
                                                        ;PAGE TRAPPED BEFORE COMPLETING
                                                        ;OR RELOCATION FAILED SINCE THE
                                                        ;MOVE DID NOT CORRECTLY LOAD R3
015552  016777  165260  165254  DONE42: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
015560  005077  165252                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
015564  005077  165234                  CLR     @SR0
015570  005037  177776                  CLR     @#PS

                                        ;SHOW THAT A DATO (NO DATIP) TO A RRWT PAGE (ACF=4) WITHOUT
                                        ;MEMORY MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
                                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
015574  104400                  TEST43: SCOPE
015576  012737  000043  177570          MOV     #43,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
015604  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
015610  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
015614  005077  165204                  CLR     @SR0            ;INITIALIZE SR0
015620  012746  000004                  MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
015624  004767  004460                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
015630  012777  015770  165176          MOV     #RET43,@KTVEC   ;SETUP ABORT RETURN IN CASE
015636  005077  165174                  CLR     @KTSTA
015642  005067  165544                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RRWT PAGE
015646  012701  023412                  MOV     #DESTAD+20000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
015652  112777  000001  165144          MOVB    #1,@SR0         ;TURN ON KT11-C
015660  012721  125252                  MOV     #125252,(R1)+   ;DATO TO RRWT PAGE-SHOULDN'T TRAP OR ABORT
015664  017702  165134                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
015670  005377  165130                  DEC     @SR0            ;TURN OFF KT11-C
015674  022702  010021                  CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
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015700  001401                          BEQ     .+4
015702  104006                          HLT
                                                        ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                        ;THE REFERENCE TO DATA SPACE, PAGE 0,
                                                        ;WHICH GOT THE ADDRESS OF SR0, AND MMGT TRAP
                                                        ;SHOULD BE SET
015704  022777  000027  165114          CMP     #27,@SR1        ;CHECK SR1
015712  001401                          BEQ     .+4
015714  104006                          HLT
                                                        ;SR1 INCORRECT-SHOULD KEEP TRACKING
                                                        ;EVEN WITH KT11-C OFF
015716  022777  015716  165104          CMP     #.,@SR2         ;CHECK SR2
015724  001401                          BEQ     .+4
015726  104006                          HLT
                                                        ;SR2 INCORRECT-SHOULD KEEP TRACKING
015730  022777  077404  165304          CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
015736  001401                          BEQ     .+4
015740  104006                          HLT
                                                        ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                                        ;BEEN CHANGED SINCE THE RRWT REFERENCE
                                                        ;WAS TO DATA SPACE
015742  022777  077704  165312          CMP     #77704,@KDPDR1  ;CHECK DATA SPACE PDR
015750  001401                          BEQ     .+4
015752  104006                          HLT
                                                        ;KDPDR1 INCORRECT- "A" BIT SHOULD BE SET SINCE PAGE
                                                        ;WAS ACCESSED, AND "W" BIT SHOULD
                                                        ;BE SET SINCE IT WAS WRITTEN INTO
015754  026727  165432  125252          CMP     DESTAD,#125252  ;MAKE CERTAIN THAT DESTINATION
015762  001401                          BEQ     .+4             ;LOCATION WAS WRITTEN INTO
015764  104006                          HLT                     ;DATO TO RRWT PAGE DIDN'T WRITE
                                                                ;INTO THE DESTINATION LOCATION
015766  000404                          BR      DONE43
015770  042777  000001  165026  RET43: BIC     #1,@SR0         ;TURN OFF KT11-C
015776  104006                          HLT                     ;DATO TO RRWT PAGE TRAPPED WITHOUT MMGT TRAP ENABLED
016000  016777  165032  165026  DONE43: MOV    KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
016006  005077  165024                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
016012  005077  165006                  CLR     @SR0
016016  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATO (NO DATIP) TO A RRWT PAGE (ACF=4) WITH
                                ;MEMORY MANAGEMENT TRAP ENABLE SET TRAPS AFTER THE INSTRUCTION IS COMPLETED
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
016022  104400                  TEST44: SCOPE
016024  012737  000044  177570          MOV     #44,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
016032  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
016036  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
016042  005077  164756                  CLR     @SR0            ;INITIALIZE SR0
016046  012746  000004                  MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
016052  004767  004232                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
016056  005726                          TST     (SP)+           ;RESTORE STACK POINTER
016060  012777  016124  164746          MOV     #RET44,@KTVEC   ;SETUP TRAP RETURN
016066  005077  164744                  CLR     @KTSTA
016072  005067  165314                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RRWT PAGE
016076  012702  023412                  MOV     #DESTAD+20000,R2        ;R2 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
016102  012777  001001  164714          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
016110  012722  125252                  MOV     #125252,(R2)+   ;DATO TO RRWT PAGE-SHOULD TRAP
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016114  105377  164704                  DECB    @SR0            ;TURN OFF KT11-C
016120  104006                          HLT                     ;DATO TO RRWT PAGE FAILED TO TRAP
016122  000441                          BR      DONE44          ;WITH MEMORY MANAGEMENT TRAP ENABLE SET
016124  017701  164674          RET44:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
016130  005377  164670                  DEC     @SR0            ;TURN OFF KT11-C
016134  022701  011021                  CMP     #11021,R1       ;CHECK SAVED CONTENTS OF SR0
016140  001401                          BEQ     .+4
016142  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED THE
                                                                ;REFERENCE TO DATA SPACE, PAGE 0,
                                                                ;WHICH GOT THE ADDRESS OF SR0, AND MMGT TRAP
                                                                ;SHOULD BE SET
016144  022777  000027  164654          CMP     #27,@SR1        ;CHECK SR1
016152  001401                          BEQ     .+4
016154  104006                          HLT                     ;SR1 INCORRECT-SHOULD
                                                                ;KEEP TRACKING EVEN WITH KT11-C OFF
016156  022777  016156  164644          CMP     #.,@SR2         ;CHECK SR2
016164  001401                          BEQ     .+4
016166  104006                          HLT                     ;SR2 INCORRECT-SHOULD KEEP TRACKING
016170  022777  077404  165044          CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
016176  001401                          BEQ     .+4
016200  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RRWT
                                                                ;REFERENCE WAS TO DATA SPACE
016202  022777  077704  165052          CMP     #77704,@KDPDR1  ;CHECK DATA SPACE PDR
016210  001401                          BEQ     .+4
016212  104006                          HLT                     ;KDPDR1 INCORRECT-"A" AND "W" BITS
                                                                ;SHOULD BE SET SINCE PAGE WAS
                                                                ;ACCESSED AND WRITTEN INTO
016214  026727  165172  125252          CMP     DESTAD,#125252  ;MAKE CERTAIN THAT DESTINATION
016222  001401                          BEQ     .+4             ;LOCATION WAS WRITTEN
016224  104006                          HLT                     ;DATO TO RRWT PAGE DIDN'T WRITE
                                                                ;INTO THE DESTINATION LOCATION
016226  016777  164604  164600  DONE44: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
016234  005077  164576                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
016240  005077  164560                  CLR     @SR0
016244  005037  177776                  CLR     @#PS

                                ;SHOW THAT A DATIP,DATO SEQUENCE TO A RRWT PAGE (ACF=4) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
016250  104400          TEST45: SCOPE
016252  012737  000045  177570          MOV     #45,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
016260  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
016264  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
016270  005077  164530                  CLR     @SR0            ;INITIALIZE SR0
016274  012746  000004                  MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
016300  004767  004004                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK C
016304  005726                          TST     (SP)+           ;RESTORE STACK POINTER
016306  012777  016444  164520          MOV     #RET45,@KTVEC   ;SETUP ABORT RETURN IN CASE
016314  005077  164516                  CLR     @KTSTA
016320  012767  125252  165064          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE REFERENCED
016326  012701  023414                  MOV     #DESTAD+20002,R1        ;R1 CONTAINS VIRTUAL ADDRESS +2 OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
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016332  005277  164466          INC     @SR0            ;TURN ON KT11-C
016336  062741  052526          ADD     #52526,-(R1)    ;DATIP,DATO TO RRWT PAGE-SHOULDN'T TRAP
                                                        ;SINCE TRAP ENABLE ISN'T SET
016342  017702  164456          MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
016346  105377  164452          DECB    @SR0            ;TURN OFF KT11-C
016352  022702  010021          CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
016356  001401                  BEQ     .+4
016360  104006                  HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                        ;TRACKED REFERENCE TO DATA SPACE,
                                                        ;PAGE 0, WHICH GOT THE ADDRESS
                                                        ;OF SR0, AND MMGT TRAP SHOULD BE SET
016362  022777  000027  164436  CMP     #27,@SR1        ;CHECK SR1
016370  001401                  BEQ     .+4
016372  104006                  HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                        ;TRACKING EVEN WITH KT11-C OFF
016374  022777  016374  164426  CMP     .,@SR2          ;CHECK SR2
016402  001401                  BEQ     .+4
016404  104006                  HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                        ;WHEN KT11-C IS OFF
016406  022777  077404  164626  CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
016414  001401                  BEQ     .+4             ;THE RRWT PAGE REFERENCED
016416  104006                  HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                        ;HAVE BEEN CHANGED SINCE THE
                                                        ;RRWT REFERENCE WAS TO DATA SPACE
016420  022777  077704  164634  CMP     #77704,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
016426  001401                  BEQ     .+4             ;TO THE RRWT REFERENCE
016430  104006                  HLT                     ;KDPDR1 INCORRECT-"A" AND "W" BITS SHOULD
                                                        ;BE SET SINCE PAGE WAS ACCESSED
                                                        ;AND WRITTEN INTO
016432  005767  164754          TST     DESTAD          ;CHECK TO SEE THAT INSTRUCTION COMPLETED
016436  001401                  BEQ     .+4
016440  104006                  HLT                     ;DATIP, DATO TO RRWT PAGE FAILED TO COMPLETE

016442  000404                  BR      DONE45
016444  042777  000001  164352  RET45:  BIC     #1,@SR0         ;TURN OFF KT11-C
016452  104006                  HLT                     ;DATIP, DATO TO RRWT PAGE CAUSED
                                                        ;A TRAP OR ABORT ALTHOUGH MEMORY
                                                        ;MANAGEMENT TRAP ENABLE WAS NOT SET
016454  016777  164356  164352  DONE45: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
016462  005077  164350          CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
016466  005077  164332          CLR     @SR0            ;INITIALIZE SR0
016472  005037  177776          CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                        ;SHOW THAT A DATIP, DATO SEQUENCE TO A RRWT PAGE (ACF=4) WITH MEMORY MANAGEMENT
                        ;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                        ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
016476  104400          TEST46: SCOPE
016500  012737  000046  177570  MOV     #46,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
016506  005037  177776          CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
016512  012706  001000          MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
016516  005077  164302          CLR     @SR0            ;INITIALIZE SR0
016522  012746  000004          MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
016526  004767  003556          JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
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016532  005726                          TST     (SP)+           ;RESTORE STACK POINTER
016534  012777  016604  164272          MOV     #RET46,@KTVEC   ;SETUP TRAP RETURN
016542  005077  164270                  CLR     @KTSTA
016546  012767  125252  164636          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
016554  005003                          CLR     R3              ;CLEAR REGISTER TO SAVE WHAT WAS READ
                                                                ;ALLOWS CHECKING TO SEE THAT THE
                                                                ;INSTRUCTION COMPLETED BEFORE
                                                                ;TRAPPING
016556  012704  023412                  MOV     #DESTAD+20000,R4        ;R4 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
016562  012777  001001  164234          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
016570  062724  052526                  ADD     #52526,(R4)+    ;DATIP, DATO TO RRWT PAGE-SHOULD TRAP
                                                                ;SINCE TRAP ENABLE IS SET
016574  105077  164224                  CLRB    @SR0            ;IF NO TRAP, TURN OFF KT11-C
016600  104006                          HLT                     ;DATIP, DATO TO RRWT PAGE WITH MEMORY
016602  000444                          BR      DONE46          ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                                ;CAUSE A TRAP
016604  017702  164214          RET46:  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
016610  005377  164210                  DEC     @SR0            ;TURN OFF KT11-C
016614  022702  011021                  CMP     #11021,R2       ;CHECK SAVED CONTENTS OF SR0
016620  001401                          BEQ     .+4
016622  104006                          HLT
                                                                ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE
                                                                ;0, WHICH GOT THE ADDRESS OF SR0,
                                                                ;AND MMGT TRAP SHOULD BE SET
016624  022777  000027  164174          CMP     #27,@SR1        ;CHECK SR1
016632  001401                          BEQ     .+4
016634  104006                          HLT
                                                                ;SR1 INCORRECT-SHOULD CONTINUE
                                                                ;TRACKING WITH KT11-C OFF
016636  022777  016636  164164          CMP     #.,@SR2         ;CHECK SR2
016644  001401                          BEQ     .+4
016646  104006                          HLT
                                                                ;SR2 INCORRECT-SHOULD STILL BE
                                                                ;TRACKING EVEN WITH KT11-C OFF
016650  022777  077404  164364          CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
016656  001401                          BEQ     .+4
016660  104006                          HLT
                                                                ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RRWT
                                                                ;REFERENCE WAS TO DATA SPACE
016662  022777  077704  164372          CMP     #77704,@KDPDR1  ;CHECK DATA SPACE PDR
016670  001401                          BEQ     .+4
016672  104006                          HLT
                                                                ;KDPDR1 INCORRECT-"A" AND "W" BITS SHOULD
                                                                ;BE SET SINCE DATA SPACE WAS RRWT
                                                                ;AND WAS READ AND WRITTEN
016674  005767  164512                  TST     DESTAD          ;CHECK LOCATION WRITTEN INTO
016700  001401                          BEQ     .+4
016702  104006                          HLT
                                                                ;THE INSTRUCTION REFERENCING THE RRWT
                                                                ;PAGE TRAPPED BEFORE COMPLETING
016704  022704  023414                  CMP     #DESTAD+20002,R4        ;CHECK TO SEE THAT R4 AUTOINCREMENTED
016710  001401                          BEQ     .+4
016712  104006                          HLT                     ;AUTOINCREMENT OF R4 ON TRAPPED INSTRUCTION DIDN'T OCCUR
016714  016777  164116  164112  DONE46: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
016722  005077  164110                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
016726  005077  164072                  CLR     @SR0
016732  005037  177776                  CLR     @#PS

                        ;SHOW THAT DATIP, DATOB SEQUENCE TO A RRWT PAGE (ACF=4) WITHOUT MEMORY
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                                        ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
016736  104400                          TEST47: SCOPE
016740  012737  000047  177570                  MOV     #47,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
016746  005037  177776                          CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
016752  012706  001000                          MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
016756  005077  164042                          CLR     @SR0            ;INITIALIZE SR0
016762  012746  000004                          MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
016766  004767  003316                          JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
016772  005726                                  TST     (SP)+           ;RESTORE STACK POINTER
016774  012777  017130  164032                  MOV     #RET47,@KTVEC   ;SETUP ABORT RETURN IN CASE
017002  005077  164030                          CLR     @KTSTA
017006  005067  164400                          CLR     DESTAD          ;INITIALIZE LOCATION TO BE REFERENCED
017012  012701  023413                          MOV     #DESTAD+20001,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                        ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
017016  005277  164002                          INC     @SR0            ;TURN ON KT11-C
017022  105221                                  INCB    (R1)+           ;DATIP, DATOB TO RRWT PAGE-SHOULDN'T TRAP
                                                                        ;SINCE TRAP ENABLE ISN'T SET
017024  017702  163774                          MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
017030  105377  163770                          DECB    @SR0            ;TURN OFF KT11-C
017034  022702  010021                          CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
017040  001401                                  BEQ     .+4
017042  104006                                  HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                        ;TRACKED REFERENCE TO DATA SPACE,
                                                                        ;PAGE 0, WHICH GOT THE ADDRESS
                                                                        ;OF SR0, AND MMGT TRAP SHOULD BE SET
017044  022777  000027  163754                  CMP     #27,@SR1        ;CHECK SR1
017052  001401                                  BEQ     .+4
017054  104006                                  HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                        ;TRACKING EVEN WITH KT11-C OFF
017056  022777  017056  163744                  CMP     #.,@SR2         ;CHECK SR2
017064  001401                                  BEQ     .+4
017066  104006                                  HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                        ;WHEN KT11-C IS OFF
017070  022777  077404  164144                  CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
017076  001401                                  BEQ     .+4             ;THE RRWT PAGE REFERENCED
017100  104006                                  HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                        ;HAVE BEEN CHANGED SINCE THE
                                                                        ;RRWT REFERENCE WAS TO DATA SPACE
017102  022777  077704  164152                  CMP     #77704,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
017110  001401                                  BEQ     .+4             ;TO THE RRWT REFERENCE
017112  104006                                  HLT                     ;KDPDR1 INCORRECT-"A" AND "W" BITS SHOULD
                                                                        ;BE SET SINCE DATA SPACE WAS WRITTEN INTO
                                                                        ;AND WAS RRWT
017114  022767  000400  164270                  CMP     #400,DESTAD     ;CHECK TO SEE THAT INSTRUCTION WAS CORRECTLY EXECUTED
017122  001401                                  BEQ     .+4
017124  104006                                  HLT                     ;DATIP,DATOB TO RRWT PAGE LEFT WRONG VALUE
                                                                        ;IN DESTINATION ADDRESS
017126  000404                                  BR      DONE47
017130  042777  000001  163666  RET47:          BIC     #1,@SR0         ;TURN OFF KT11-C
017136  104006                                  HLT                     ;DATIP, DATOB TO RRWT PAGE CAUSED
                                                                        ;A TRAP OR ABORT ALTHOUGH MEMORY
                                                                        ;MANAGEMENT TRAP ENABLE WAS NOT SET
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017140  016777  163672  163666  DONE47: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
017146  005077  163664                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
017152  005077  163646                  CLR     @SR0            ;INITIALIZE SR0
017156  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATIP, DATOB SEQUENCE TO A RRWT PAGE (ACF=4) WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
017162  104400                  TEST50: SCOPE
017164  012737  000050  177570          MOV     #50,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
017172  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
017176  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
017202  005077  163616                  CLR     @SR0            ;INITIALIZE SR0
017206  012746  000004                  MOV     #4,-(SP)        ;PUSH RRWT KEY ON STACK
017212  004767  003072                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
017216  005726                  TST     (SP)+           ;RESTORE STACK POINTER
017220  012777  017264  163606          MOV     #RET50,@KTVEC   ;SETUP TRAP RETURN
017226  005077  163604                  CLR     @KTSTA
017232  012767  125252  164152          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE ACCESSED
017240  012702  023413                  MOV     #DESTAD+20001,R2        ;R2 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
017244  012777  001001  163552          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
017252  105222                  INCB    (R2)+           ;DATIP, DATOB TO RRWT PAGE-SHOULD TRAP
                                                                ;SINCE TRAP ENABLE IS SET
017254  105077  163544                  CLRB    @SR0            ;IF NO TRAP, TURN OFF KT11-C
017260  104006                  HLT                     ;DATIP, DATOB TO RRWT PAGE WITH MEMORY
017262  000445                  BR      DONE50          ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                                ;CAUSE A TRAP
017264  017703  163534  RET50:  MOV     @SR0,R3         ;SAVE CONTENTS OF SR0
017270  005377  163530          DEC     @SR0            ;TURN OFF KT11-C
017274  022703  011021          CMP     #11021,R3       ;CHECK SAVED CONTENTS OF SR0
017300  001401                  BEQ     .+4
017302  104006                  HLT
                                                                ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE
                                                                ;0, WHICH GOT THE ADDRESS OF SR0,
                                                                ;AND MMGT TRAP SHOULD BE SET
017304  022777  000027  163514          CMP     #27,@SR1        ;CHECK SR1
017312  001401                  BEQ     .+4
017314  104006                  HLT
                                                                ;SR1 INCORRECT-SHOULD CONTINUE
                                                                ;TRACKING WITH KT11-C OFF
017316  022777  017316  163504          CMP     #.,@SR2         ;CHECK SR2
017324  001401                  BEQ     .+4
017326  104006                  HLT
                                                                ;SR2 INCORRECT-SHOULD STILL BE
                                                                ;TRACKING EVEN WITH KT11-C OFF
017330  022777  077404  163704          CMP     #77404,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR
017336  001401                  BEQ     .+4
017340  104006                  HLT
                                                                ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RRWT
                                                                ;REFERENCE WAS TO DATA SPACE
017342  022777  077704  163712          CMP     #77704,@KDPDR1  ;CHECK DATA SPACE PDR
017350  001401                  BEQ     .+4
017352  104006                  HLT
                                                                ;KDPDR1 INCORRECT-"A" AND "W" BITS SHOULD
                                                                ;BE SET SINCE DATA SPACE WAS RRWT
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                                                                ;AND WAS WRITTEN
017354  022767  125652  164030            CMP     #125652,DESTAD  ;CHECK LOCATION WRITTEN INTO
017362  001401                            BEQ     .+4
017364  104006                            HLT                     ;THE INSTRUCTION REFERENCING THE RRWT
                                                                ;PAGE TRAPPED BEFORE COMPLETING
017366  022702  023414                    CMP     #DESTAD+20002,R2
017372  001401                            BEQ     .+4
017374  104006                            HLT                     ;AUTOINCREMENT IN THE INSTRUCTION
                                                                ;REFERENCING THE RRWT PAGE
                                                                ;FAILED TO COMPLETE
017376  016777  163434  163430  DONE50:  MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
017404  005077  163426                    CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
017410  005077  163410                    CLR     @SR0
017414  005037  177776                    CLR     @#PS

                                ;SHOW THAT DATI TO A RRWTW PAGE (ACF=5) WITHOUT MEMORY
                                ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
017420  104400                  TEST51: SCOPE
017422  012737  000051  177570            MOV     #51,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
017430  005037  177776                    CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
017434  012706  001000                    MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
017440  005077  163360                    CLR     @SR0            ;INITIALIZE SR0
017444  012746  000005                    MOV     #5,-(SP)        ;PUSH RRWTW KEY ON STACK
017450  004767  002634                    JSR     %7,SETUP        ;MAKE KERNEL PAGE 1 RRWTW, BANK 0
                                                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
017454  005726                            TST     (SP)+           ;RESTORE STACK POINTER
017456  012777  017616  163350            MOV     #RET51,@KTVEC   ;SETUP ABORT RETURN IN CASE
017464  005077  163346                    CLR     @KTSTA
017470  012767  125252  163714            MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE REFERENCED
017476  012701  023412                    MOV     #DESTAD+20000,R1        ;R1 CONTAINS ADDRESS OF LOCATION TO
                                                                ;BE REFERENCED THRU KERNEL PAGE 1
017502  005277  163316                    INC     @SR0            ;TURN ON KT11-C
017506  022721  125252                    CMP     #125252,(R1)+   ;DATI TO RRWTW PAGE-SHOULDN'T TRAP OR ABORT
017512  001404                            BEQ     OK51
017514  005377  163304                    DEC     @SR0            ;ON ERROR, TURN OFF KT11-C
017520  104006                            HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 1
017522  000441                            BR      DONE51
017524  017702  163274          OK51:     MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
017530  105377  163270                    DECB    @SR0            ;TURN OFF KT11-C
017534  022702  000021                    CMP     #21,R2          ;CHECK SAVED CONTENTS OF SR0
017540  001401                            BEQ     .+4
017542  104006                            HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                ;TRACKED REFERENCE TO DATA SPACE,
                                                                ;PAGE 0, WHICH GOT THE ADDRESS
                                                                ;OF SR0
017544  022777  000027  163254            CMP     #27,@SR1        ;CHECK SR1
017552  001401                            BEQ     .+4
017554  104006                            HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                ;TRACKING EVEN WITH KT11-C OFF
017556  022777  017556  163244            CMP     #.,@SR2         ;CHECK SR2
017564  001401                            BEQ     .+4
017566  104006                            HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                ;WHEN KT11-C IS OFF
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017570  022777  077405  163444          CMP     #77405,@KIPDR1  ;CHECK INSTRUCTION SPACE PDR FOR
017576  001401                          BEQ     .+4             ;THE RRWTW PAGE REFERENCED
017600  104006                          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
017602  022777  077405  163452          CMP     #77405,@KDPDR1  ;CHECK DATA SPACE PDR CORRESPONDING
017610  001401                          BEQ     .+4             ;TO THE RRWTW REFERENCE
017612  104006                          HLT                     ;KDPDR1 INCORRECT - SHOULD NOT
                                                                ;HAVE BEEN CHANGED
017614  000404                          BR      DONE51
017616  042777  000001  163200  RET51: BIC     #1,@SR0         ;TURN OFF KT11-C
017624  104006                          HLT                     ;DATI TO RRWTW PAGE CAUSED
                                                                ;A TRAP OR ABORT
017626  016777  163204  163200  DONE51: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
017634  005077  163176                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
017640  005077  163160                  CLR     @SR0            ;INITIALIZE SR0
017644  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATI TO A RRWTW PAGE (ACF=5) WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
017650  104400                  TEST52: SCOPE
017652  012737  000052  177570          MOV     #52,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
017660  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
017664  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
017670  005077  163130                  CLR     @SR0            ;INITIALIZE SR0
017674  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
017700  004767  002404                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
017704  005726                          TST     (SP)+           ;RESTORE STACK POINTER
017706  012777  000200  163406          MOV     #200,@KDPAR1    ;MAP KERNEL PAGE 1
017714  012777  000200  163360          MOV     #200,@KIPAR1    ;TO BANK 1
017722  012777  077405  163334          MOV     #77405,@KDPDR2  ;CHANGE MAP TO MAKE PAGE 2 RRWTW
017730  012777  077405  163306          MOV     #77405,@KIPDR2
017736  012777  020072  163070          MOV     #RET52,@KTVEC   ;SETUP TRAP RETURN IN CASE
017744  005777  163066                  CLR     @KTSTA
017750  012767  125252  163434          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
017756  012701  043412                  MOV     #DESTAD+40000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
017762  012777  001001  163034          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
017770  022721  125252                  CMP     #125252,(R1)+   ;DATI TO RRWTW PAGE-SHOULDN'T TRAP OR ABORT
017774  001401                          BEQ     .+4
017776  104006                          HLT                     ;RELOCATION FAILED THRU KERNEL PAGE 2
020000  017702  163020                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
020004  005377  163014                  DEC     @SR0            ;TURN OFF KT11-C
020010  022702  001021                  CMP     #1021,R2        ;CHECK SAVED CONTENTS OF SR0
020014  001401                          BEQ     .+4
020016  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE
                                                                ;0, WHICH GOT THE ADDRESS OF SR0
020020  022777  000027  163000          CMP     #27,@SR1        ;CHECK SR1
020026  001401                          BEQ     .+4
020030  104006                          HLT                     ;SR1 INCORRECT-SHOULD CONTINUE
                                                                ;TRACKING WITH KT11-C OFF
020032  022777  020032  162770          CMP     #.,@SR2         ;CHECK SR2
020040  001401                          BEQ     .+4
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020042  104006                          HLT                     ;SR2 INCORRECT-SHOULD STILL BE
                                                                ;TRACKING EVEN WITH KT11-C OFF
020044  022777  077405  163172          CMP     #77405,@KIPDR2  ;CHECK INSTRUCTION SPACE PDR
020052  001401                          BEQ     .+4
020054  104006                          HLT                     ;KIPDR2 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED
020056  022777  077405  163200          CMP     #77405,@KDPDR2  ;CHECK DATA SPACE PDR
020064  001401                          BEQ     .+4
020066  104006                          HLT                     ;KDPDR2 INCORRECT - SHOULD NOT
                                                                ;HAVE BEEN CHANGED
020070  000404                          BR      DONE52
020072  042777  000001  162724  RET52:  BIC     #1,@SR0         ;TURN OFF KT11-C
020100  104006                          HLT                     ;DATI TO RRWTW PAGE TRAPPED OR ABORTED
020102  016777  162730  162724  DONE52: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
020110  005077  162722                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
020114  005077  162704                  CLR     @SR0
020120  005037  177776                  CLR     @#PS


                                ;SHOW THAT A DATO (NO DATIP) TO A RRWTW PAGE (ACF=5) WITHOUT
                                ;MEMORY MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
020124  104400                  TEST53: SCOPE
020126  012737  000053  177570          MOV     #53,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
020134  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
020140  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
020144  005077  162654                  CLR     @SR0            ;INITIALIZE SR0
020150  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
020154  004767  002130                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
020160  005726                          TST     (SP)+           ;RESTORE STACK POINTER
020162  012777  000200  163132          MOV     #200,@KDPAR1    ;CHANGE MAP TO RUN CODE IN SECOND BANK
020170  012777  000200  163104          MOV     #200,@KIPAR1
020176  012777  077405  163060          MOV     #77405,@KDPDR2  ;MAP KERNEL PAGE 2 RRWTW
020204  012777  077405  163032          MOV     #77405,@KIPDR2
020212  012777  020352  162614          MOV     #RET53,@KTVEC   ;SETUP ABORT RETURN IN CASE
020220  005077  162612                  CLR     @KTSTA
020224  005067  163162                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RRWTW PAGE
020230  012701  043412                  MOV     #DESTAD+40000,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 2
020234  112777  000001  162562          MOVB    #1,@SR0         ;TURN ON KT11-C
020242  012721  125252                  MOV     #125252,(R1)+   ;DATO TO RRWTW PAGE-SHOULDN'T TRAP
                                                                ;SINCE TRAP ENABLE ISN'T SET
020246  017702  162552                  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
020252  005377  162546                  DEC     @SR0            ;TURN OFF KT11-C
020256  022702  010021                  CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
020262  001401                          BEQ     .+4
020264  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE 0,
                                                                ;WHICH GOT THE ADDRESS OF SR0, AND MMGT
                                                                ;TRAP SHOULD BE SET
020266  022777  000027  162532          CMP     #27,@SR1        ;CHECK SR1
020274  001401                          BEQ     .+4
020276  104006                          HLT                     ;SR1 INCORRECT-SHOULD KEEP TRACKING
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                                                                ;EVEN WITH KT11-C OFF
020300  022777  020300  162522          CMP     #.,@SR2         ;CHECK SR2
020306  001401                          BEQ     .+4
020310  104006                          HLT                     ;SR2 INCORRECT-SHOULD KEEP TRACKING
020312  022777  077405  162724          CMP     #77405,@KIPDR2  ;CHECK INSTRUCTION SPACE PDR
020320  001401                          BEQ     .+4
020322  104006                          HLT                     ;KIPDR2 INCORRECT-SHOULD NOT HAVE
                                                                ;BEEN CHANGED SINCE THE RRWTW REFERENCE
                                                                ;WAS TO DATA SPACE
020324  022777  077705  162732          CMP     #77705,@KDPDR2  ;CHECK DATA SPACE PDR
020332  001401                          BEQ     .+4
020334  104006                          HLT                     ;KDPDR2 INCORRECT- "A" BIT SHOULD BE SET SINCE PAGE
                                                                ;WAS ACCESSED, AND "W" BIT SHOULD
                                                                ;BE SET SINCE IT WAS WRITTEN INTO
020336  026727  163050  125252          CMP     DESTAD,#125252  ;MAKE CERTAIN THAT DESTINATION
020344  001401                          BEQ     .+4             ;LOCATION WAS WRITTEN INTO
020346  104006                          HLT                     ;DATO TO RRWTW PAGE DIDN'T WRITE
                                                                ;INTO THE DESTINATION LOCATION
020350  000404                          BR      DONE53
020352  042777  000001  162444  RET53:  BIC     #1,@SR0         ;TURN OFF KT11-C
020360  104006                          HLT                     ;DATO TO RRWTW PAGE TRAPPED WITHOUT MMGT TRAP ENABLED
020362  016777  162450  162444  DONE53: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
020370  005077  162442                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
020374  005077  162424                  CLR     @SR0
020400  005037  177776                  CLR     @#PS

                        ;SHOW THAT A DATO (NO DATIP) TO A RRWTW PAGE (ACF=5) WITH
                        ;MEMORY MANAGEMENT TRAP ENABLE SET TRAPS AFTER THE INSTRUCTION IS COMPLETED
                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
                        ;CORRESPONDING TO THE REFERENCE IS CORRECT
020404  104400          TEST54: SCOPE
020406  012737  000054  177570          MOV     #54,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
020414  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
020420  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
020424  005077  162374                  CLR     @SR0            ;INITIALIZE SR0
020430  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
020434  004767  001650                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
020440  005726                          TST     (SP)+           ;RESTORE STACK POINTER
                                                                ;NOW CHANGE MAP TO ALLOW RUNNING CODE
                                                                ;ABOVE PHYSICAL ADDRESS 20000
020442  012777  000200  162652          MOV     #200,@KDPAR1    ;MAP KERNEL PAGE 1 TO BANK 1
020450  012777  000200  162624          MOV     #200,@KIPAR1
020456  012777  077405  162600          MOV     #77405,@KDPDR2  ;MAKE KERNEL PAGE 2 RRWTW
020464  012777  077405  162552          MOV     #77405,@KIPDR2
020472  012777  020536  162334          MOV     #RET54,@KTVEC   ;SETUP TRAP RETURN
020500  005077  162332                  CLR     @KTSTA
020504  005067  162702                  CLR     DESTAD          ;INITIALIZE LOCATION TO BE ADDRESSED
                                                                ;BY DATO TO RRWTW PAGE
020510  012702  043412                  MOV     #DESTAD+40000,R2        ;R2 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                                                ;TO BE REFERENCED THRU KERNEL PAGE 2
020514  012777  001001  162302          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
020522  012722  125252                  MOV     #125252,(R2)+   ;DATO TO RRWTW PAGE-SHOULD TRAP
                                                                ;SINCE TRAP ENABLE IS SET
020526  105377  162272                  DECB    @SR0            ;TURN OFF KT11-C
020532  104006                          HLT                     ;DATO TO RRWTW PAGE FAILED TO TRAP
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020534  000441                          BR      DONE54
020536  017701  162262          RET54:  MOV     @SR0,R1         ;SAVE CONTENTS OF SR0
020542  005377  162256                  DEC     @SR0            ;TURN OFF KT11-C
020546  022701  011021                  CMP     #11021,R1       ;CHECK SAVED CONTENTS OF SR0
020552  001401                          BEQ     .+4
020554  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED THE
                                                                ;REFERENCE TO DATA SPACE, PAGE 0,
                                                                ;WHICH GOT THE ADDRESS OF SR0, AND MMGT TRAP
                                                                ;SHOULD BE SET
020556  022777  000027  162242          CMP     #27,@SR1        ;CHECK SR1
020564  001401                          BEQ     .+4
020566  104006                          HLT                     ;SR1 INCORRECT-SHOULD
                                                                ;KEEP TRACKING EVEN WITH KT11-C OFF
020570  022777  020570  162232          CMP     #.,@SR2         ;CHECK SR2
020576  001401                          BEQ     .+4
020600  104006                          HLT                     ;SR2 INCORRECT-SHOULD KEEP TRACKING
020602  022777  077405  162434          CMP     #77405,@KIPDR2  ;CHECK INSTRUCTION SPACE PDR
020610  001401                          BEQ     .+4
020612  104006                          HLT                     ;KIPDR2 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RRWTW
                                                                ;REFERENCE WAS TO DATA SPACE
020614  022777  077705  162442          CMP     #77705,@KDPDR2  ;CHECK DATA SPACE PDR
020622  001401                          BEQ     .+4
020624  104006                          HLT                     ;KDPDR2 INCORRECT-"A" AND "W" BITS
                                                                ;SHOULD BE SET SINCE PAGE WAS WRITTEN INTO
020626  026727  162560  125252          CMP     DESTAD,#125252  ;MAKE CERTAIN THAT DESTINATION
020634  001401                          BEQ     .+4             ;LOCATION WAS WRITTEN
020636  104006                          HLT                     ;DATO TO RRWTW PAGE DIDN'T WRITE
                                                                ;INTO THE DESTINATION LOCATION
020640  016777  162172  162166  DONE54: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN
020646  005077  162164                  CLR     @KTSTA          ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
020652  005077  162146                  CLR     @SR0
020656  005037  177776                  CLR     @#PS

                                        ;SHOW THAT A DATIP,DATO SEQUENCE TO A RRWTW PAGE (ACF=5) WITHOUT MEMORY
                                        ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
020662  104400                  TEST55: SCOPE
020664  012737  000055  177570          MOV     #55,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
020672  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
020676  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
020702  005077  162116                  CLR     @SR0            ;INITIALIZE SR0
020706  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
020712  004767  001372                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
020716  005726                          TST     (SP)+           ;RESTORE STACK POINTER
                                                                ;NOW CHANGE MAP TO ALLOW RUNNING CODE
                                                                ;IN BANK 1
020720  012777  000200  162374          MOV     #200,@KDPAR1    ;MAP KERNEL PAGE 1 TO BANK 1
020726  012777  000200  162346          MOV     #200,@KIPAR1
020734  012777  077405  162322          MOV     #77405,@KDPDR2  ;MAKE KERNEL PAGE 2 RRWTW
020742  012777  077405  162274          MOV     #77405,@KIPDR2
020750  012777  021106  162056          MOV     #RET55,@KTVEC   ;SETUP ABORT RETURN IN CASE
020756  005077  162054                  CLR     @KTSTA
020762  012767  125252  162422          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE REFERENCED
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021070  012737  043414                  MOV     #DESTAD+40002,R1        ;R1 CONTAINS VIRTUAL ADDRESS +2 OF
                                                                        ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
021074  005277  162024                  INC     @SR0                    ;TURN ON KT11-C
021000  062741  052526                  ADD     #52526,-(R1)            ;DATIP,DATO TO RRWTW PAGE-SHOULDN'T TRAP
                                                                        ;SINCE TRAP ENABLE ISN'T SET
021004  017702  162014                  MOV     @SR0,R2                 ;SAVE CONTENTS OF SR0
021010  105377  162010                  DECB    @SR0                    ;TURN OFF KT11-C
021014  022702  010021                  CMP     #10021,R2               ;CHECK SAVED CONTENTS OF SR0
021020  001401                          BEQ     .+4
021022  104006                          HLT                             ;SR0 INCORRECT-SHOULD HAVE
                                                                        ;TRACKED REFERENCE TO DATA SPACE,
                                                                        ;PAGE 0, WHICH GOT THE ADDRESS
                                                                        ;OF SR0, AND MMGT TRAP SHOULD BE SET
021024  022777  000027  161774          CMP     #27,@SR1                ;CHECK SR1
021032  001401                          BEQ     .+4
021034  104006                          HLT                             ;SR1 INCORRECT-SHOULD KEEP
                                                                        ;TRACKING EVEN WITH KT11-C OFF
021036  022777  021036  161764          CMP     #.,@SR2                 ;CHECK SR2
021044  001401                          BEQ     .+4
021046  104006                          HLT                             ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                        ;WHEN KT11-C IS OFF
021050  022777  077405  162166          CMP     #77405,@KIPDR2          ;CHECK INSTRUCTION SPACE PDR FOR
021056  001401                          BEQ     .+4                     ;THE RRWTW PAGE REFERENCED
021060  104006                          HLT                             ;KIPDR2 INCORRECT-SHOULD NOT
                                                                        ;HAVE BEEN CHANGED SINCE THE
                                                                        ;RRWTW REFERENCE WAS TO DATA SPACE
021062  022777  077705  162174          CMP     #77705,@KDPDR2          ;CHECK DATA SPACE PDR CORRESPONDING
021070  001401                          BEQ     .+4                     ;TO THE RRWTW REFERENCE
021072  104006                          HLT                             ;KDPDR2 INCORRECT-"A" AND "W" BITS SHOULD
                                                                        ;BE SET SINCE PAGE WAS WRITTEN INTO
021074  005767  162312                  TST     DESTAD                  ;CHECK TO SEE THAT INSTRUCTION COMPLETED
021100  001401                          BEQ     .+4
021102  104006                          HLT                             ;DATIP, DATO TO RRWTW PAGE FAILED TO COMPLETE

021104  000404                          BR      DONE55
021106  042777  000001  161710  RET55:  BIC     #1,@SR0                 ;TURN OFF KT11-C
021114  104006                          HLT                             ;DATIP, DATO TO RRWTW PAGE CAUSED
                                                                        ;A TRAP OR ABORT ALTHOUGH MEMORY
                                                                        ;MANAGEMENT TRAP ENABLE WAS NOT SET
021116  016777  161714  161710  DONE55: MOV     KTSTA,@KTVEC            ;RESTORE TRAP RETURN TO CAUSE HALT
021124  005077  161706                  CLR     @KTSTA                  ;ON AN UNEXPECTED TRAP
021130  005077  161670                  CLR     @SR0                    ;INITIALIZE SR0
021134  005037  177776                  CLR     @#PS                    ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATIP, DATO SEQUENCE TO A RRWTW PAGE (ACF=5) WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
021140  104400                  TEST56: SCOPE
021142  012737  000056  177570          MOV     #56,@#SR                ;LOAD TEST NUMBER INTO THE DISPLAY
021150  005037  177776                  CLR     @#PS                    ;INITIALIZE PROCESSOR STATUS
021154  012706  001000                  MOV     #KSTACK,SP              ;INITIALIZE KERNEL STACK POINTER
021160  005077  161640                  CLR     @SR0                    ;INITIALIZE SR0
021164  012746  000006                  MOV     #6,-(SP)                ;PUSH RW KEY ON STACK
021170  004767  001114                  JSR     %7,SETUP                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
```

```
021174  005726                          TST     (SP)+           ;RESTORE STACK POINTER
                                                                ;ALTER MAP TO ALLOW EXECUTING CODE IN BANK 1
021176  012777  000200  162116          MOV     #200,@KDPAR1    ;MAP KERNEL PAGE 1 TO BANK 1
021204  012777  000200  162070          MOV     #200,@KIPAR1
021212  012777  077405  162044          MOV     #77405,@KDPDR2  ;MAKE KERNEL PAGE 2 RRWTW
021220  012777  077405  162016          MOV     #77405,@KIPDR2
021226  012777  021274  161600          MOV     #RET56,@KTVEC   ;SETUP TRAP RETURN
021234  005077  161576                  CLR     @KTSTA
021240  012767  125252  162144          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE READ
021246  012704  043412                  MOV     #DESTAD+40000,R4        ;R4 CONTAINS VIRTUAL ADDRESS OF LOCATION TO BE
                                                                ;REFERENCED THRU KERNEL PAGE 2
021252  012777  001001  161544          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
021260  062724  052526                  ADD     #52526,(R4)+    ;DATIP, DATO TO RRWTW PAGE-SHOULD TRAP
                                                                ;SINCE TRAP ENABLE IS SET
021264  105077  161534                  CLRB    @SR0            ;IF NO TRAP, TURN OFF KT11-C
021270  104006                          HLT                     ;DATIP, DATO TO RRWTW PAGE WITH MEMORY
021272  000444                          BR      DONE56          ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                                ;CAUSE A TRAP
021274  017702  161524          RET56:  MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
021300  005377  161520                  DEC     @SR0            ;TURN OFF KT11-C
021304  022702  011021                  CMP     #11021,R2       ;CHECK SAVED CONTENTS OF SR0
021310  001401                          BEQ     .+4
021312  104006                          HLT                     ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE
                                                                ;0, WHICH GOT THE ADDRESS OF SR0,
                                                                ;AND MMGT TRAP SHOULD BE SET
021314  022777  000027  161504          CMP     #27,@SR1        ;CHECK SR1
021322  001401                          BEQ     .+4
021324  104006                          HLT                     ;SR1 INCORRECT-SHOULD CONTINUE
                                                                ;TRACKING WITH KT11-C OFF
021326  022777  021326  161474          CMP     #.,@SR2         ;CHECK SR2
021334  001401                          BEQ     .+4
021336  104006                          HLT                     ;SR2 INCORRECT-SHOULD STILL BE
                                                                ;TRACKING EVEN WITH KT11-C OFF
021340  022777  077405  161676          CMP     #77405,@KIPDR2  ;CHECK INSTRUCTION SPACE PDR
021346  001401                          BEQ     .+4
021350  104006                          HLT                     ;KIPDR2 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RRWTW
                                                                ;REFERENCE WAS TO DATA SPACE
021352  022777  077705  161704          CMP     #77705,@KDPDR2  ;CHECK DATA SPACE PDR
021360  001401                          BEQ     .+4
021362  104006                          HLT                     ;KDPDR2 INCORRECT-"A" AND "W" BITS SHOULD
                                                                ;BE SET SINCE DATA SPACE WAS RRWTW
                                                                ;AND WAS WRITTEN
021364  005767  162022                  TST     DESTAD          ;CHECK LOCATION WRITTEN INTO
021370  001401                          BEQ     .+4
021372  104006                          HLT                     ;THE INSTRUCTION REFERENCING THE RRWTW
                                                                ;PAGE TRAPPED BEFORE COMPLETING
021374  022704  043414                  CMP     #DESTAD+40002,R4        ;CHECK TO SEE THAT R4 AUTOINCREMENTED
021400  001401                          BEQ     .+4
021402  104006                          HLT                     ;AUTOINCREMENT OF R4 ON TRAPPED INSTRUCTION DIDN'T OCCUR
021404  016777  161426  161422  DONE56: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
021412  005077  161420                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
021416  005077  161402                  CLR     @SR0
021422  005037  177776                  CLR     @#PS
```

```
                                        ;SHOW THAT DATIP, DATOB SEQUENCE TO A RRWTW PAGE (ACF=5) WITHOUT MEMORY
                                        ;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                        ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
                                        ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
021426  104400                          TEST57: SCOPE
021430  012737  000057  177570                  MOV     #57,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
021436  005037  177776                          CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
021442  012706  001000                          MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
021446  005077  161352                          CLR     @SR0            ;INITIALIZE SR0
021452  012746  000006                          MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
021456  004767  000626                          JSR     %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                        ;MAKE ALL OTHER PAGES RW, BANK 0
021462  005726                                  TST     (SP)+           ;RESTORE STACK POINTER
                                                                        ;ALTER MAP TO ALLOW EXECUTING CODE IN BANK 1
021464  012777  000200  161630                  MOV     #200,@KDPAR1    ;MAP KERNEL PAGE 1 TO BANK 1
021472  012777  000200  161602                  MOV     #200,@KIPAR1
021500  012777  077405  161556                  MOV     #77405,@KDPDR2  ;MAKE KERNEL PAGE 2 RRWTW
021506  012777  077405  161530                  MOV     #77405,@KIPDR2
021514  012777  021650  161312                  MOV     #RET57,@KTVEC   ;SETUP ABORT RETURN IN CASE
021522  005077  161310                          CLR     @KTSTA
021526  005067  161660                          CLR     DESTAD          ;INITIALIZE LOCATION TO BE REFERENCED
021532  012701  043413                          MOV     #DESTAD+40001,R1        ;R1 CONTAINS VIRTUAL ADDRESS OF
                                                                        ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
021536  005277  161262                          INC     @SR0            ;TURN ON KT11-C
021542  105221                                  INCB    (R1)+           ;DATIP, DATOB TO RRWTW PAGE-SHOULDN'T TRAP
                                                                        ;SINCE TRAP ENABLE ISN'T SET
021544  017702  161254                          MOV     @SR0,R2         ;SAVE CONTENTS OF SR0
021550  105377  161250                          DECB    @SR0            ;TURN OFF KT11-C
021554  022702  010021                          CMP     #10021,R2       ;CHECK SAVED CONTENTS OF SR0
021560  001401                                  BEQ     .+4
021562  104006                                  HLT                     ;SR0 INCORRECT-SHOULD HAVE
                                                                        ;TRACKED REFERENCE TO DATA SPACE,
                                                                        ;PAGE 0, WHICH GOT THE ADDRESS
                                                                        ;OF SR0, AND MMGT TRAP SHOULD BE SET
021564  022777  000027  161234                  CMP     #27,@SR1        ;CHECK SR1
021572  001401                                  BEQ     .+4
021574  104006                                  HLT                     ;SR1 INCORRECT-SHOULD KEEP
                                                                        ;TRACKING EVEN WITH KT11-C OFF
021576  022777  021576  161224                  CMP     #.,@SR2         ;CHECK SR2
021604  001401                                  BEQ     .+4
021606  104006                                  HLT                     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                                                        ;WHEN KT11-C IS OFF
021610  022777  077405  161426                  CMP     #77405,@KIPDR2  ;CHECK INSTRUCTION SPACE PDR FOR
021616  001401                                  BEQ     .+4             ;THE RRWTW PAGE REFERENCED
021620  104006                                  HLT                     ;KIPDR2 INCORRECT-SHOULD NOT
                                                                        ;HAVE BEEN CHANGED SINCE THE
                                                                        ;RRWTW REFERENCE WAS TO DATA SPACE
021622  022777  077705  161434                  CMP     #77705,@KDPDR2  ;CHECK DATA SPACE PDR CORRESPONDING
021630  001401                                  BEQ     .+4             ;TO THE RRWTW REFERENCE
021632  104006                                  HLT                     ;KDPDR2 INCORRECT-"A" AND "W" BITS SHOULD
                                                                        ;BE SET SINCE DATA SPACE WAS WRITTEN INTO
                                                                        ;AND WAS RRWTW
021634  022767  000400  161550                  CMP     #400,DESTAD     ;CHECK TO SEE THAT INSTRUCTION WAS CORRECTLY EXECUTED
021642  001401                                  BEQ     .+4
021644  104006                                  HLT                     ;DATIP,DATOB TO RRWTW PAGE LEFT WRONG VALUE
                                                                        ;IN DESTINATION ADDRESS
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021646  000404                          BR      DONE57
021650  042777  000001  161146  RET57:  BIC     #1,@SR0         ;TURN OFF KT11-C
021656  104006                          HLT                     ;DATIP, DATOB TO RRWTW PAGE CAUSED
                                                                ;A TRAP OR ABORT ALTHOUGH MEMORY
                                                                ;MANAGEMENT TRAP ENABLE WAS NOT SET
021660  016777  161152  161146  DONE57: MOV     KTSTA,@KTVEC    ;RESTORE TRAP RETURN TO CAUSE HALT
021666  005077  161144                  CLR     @KTSTA          ;ON AN UNEXPECTED TRAP
021672  005077  161126                  CLR     @SR0            ;INITIALIZE SR0
021676  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS

                                ;SHOW THAT A DATIP, DATOB SEQUENCE TO A RRWTW PAGE (ACF=5) WITH MEMORY MANAGEMENT
                                ;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
                                ;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
021702  104400                  TEST60: SCOPE
021704  012737  000060  177570          MOV     #60,@#SR        ;LOAD TEST NUMBER INTO THE DISPLAY
021712  005037  177776                  CLR     @#PS            ;INITIALIZE PROCESSOR STATUS
021716  012706  001000                  MOV     #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
021722  005077  161076                  CLR     @SR0            ;INITIALIZE SR0
021726  012746  000006                  MOV     #6,-(SP)        ;PUSH RW KEY ON STACK
021732  004767  000352                  JSR     %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                                                ;MAKE ALL OTHER PAGES RW, BANK 0
021736  005726                          TST     (SP)+           ;RESTORE STACK POINTER
                                                                ;ALTER MAP TO ALLOW EXECUTING CODE IN BANK 1
021740  012777  000200  161354          MOV     #200,@KDPAR1    ;MAP KERNEL PAGE 1 TO BANK 1
021746  012777  000200  161326          MOV     #200,@KIPAR1
021754  012777  077405  161302          MOV     #77405,@KDPDR2  ;MAKE KERNEL PAGE 2 RRWTW
021762  012777  077405  161254          MOV     #77405,@KIPDR2
021770  012777  022034  161036          MOV     #RET60,@KTVEC   ;SETUP TRAP RETURN
021776  005077  161034                  CLR     @KTSTA
022002  012767  125252  161402          MOV     #125252,DESTAD  ;INITIALIZE LOCATION TO BE ACCESSED
022010  012702  043413                  MOV     #DESTAD+40001,R2        ;R2 CONTAINS VIRTUAL ADDRESS OF
                                                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
022014  012777  001001  161002          MOV     #1001,@SR0      ;TURN ON KT11-C, SET MMGT TRAP ENABLE
022022  105222                          INCB    (R2)+           ;DATIP, DATOB TO RRWTW PAGE-SHOULD TRAP
                                                                ;SINCE TRAP ENABLE IS SET
022024  105077  160774                  CLRB    @SR0            ;IF NO TRAP, TURN OFF KT11-C
022030  104006                          HLT                     ;DATIP, DATOB TO RRWTW PAGE WITH MEMORY
022032  000445                          BR      DONE60          ;MANAGEMENT TRAP ENABLE SET DIDN'T
                                                                ;CAUSE A TRAP
022034  017703  160764          RET60:  MOV     @SR0,R3         ;SAVE CONTENTS OF SR0
022040  005377  160760                  DEC     @SR0            ;TURN OFF KT11-C
022044  022703  011021                  CMP     #11021,R3       ;CHECK SAVED CONTENTS OF SR0
022050  001401                          BEQ     .+4
022052  104006                          HLT
                                                                ;SR0 INCORRECT-SHOULD HAVE TRACKED
                                                                ;THE REFERENCE TO DATA SPACE, PAGE
                                                                ;0, WHICH GOT THE ADDRESS OF SR0,
                                                                ;AND MMGT TRAP SHOULD BE SET
022054  022777  000027  160744          CMP     #27,@SR1        ;CHECK SR1
022062  001401                          BEQ     .+4
022064  104006                          HLT
                                                                ;SR1 INCORRECT-SHOULD CONTINUE
                                                                ;TRACKING WITH KT11-C OFF
022066  022777  022066  160734          CMP     #.,@SR2         ;CHECK SR2
022074  001401                          BEQ     .+4
022076  104006                          HLT
                                                                ;SR2 INCORRECT-SHOULD STILL BE
                                                                ;TRACKING EVEN WITH KT11-C OFF
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022100  022777  077405  161136          CMP     #77405,@KIPDR2  ;CHECK INSTRUCTION SPACE PDR
022106  001401                          BEQ     .+4
022110  104006                          HLT                     ;KIPDR2 INCORRECT-SHOULD NOT
                                                                ;HAVE BEEN CHANGED SINCE THE RRWTW
                                                                ;REFERENCE WAS TO DATA SPACE
022112  022777  077705  161144          CMP     #77705,@KDPDR2  ;CHECK DATA SPACE PDR
022120  001401                          BEQ     .+4
022122  104006                          HLT                     ;KDPDR2 INCORRECT-"A" AND "W" BITS SHOULD
                                                                ;BE SET SINCE DATA SPACE WAS RRWTW
                                                                ;AND WAS WRITTEN
022124  022767  125652  161260          CMP     #125652,DESTAD  ;CHECK LOCATION WRITTEN INTO
022132  001401                          BEQ     .+4
022134  104006                          HLT                     ;THE INSTRUCTION REFERENCING THE RRWTW
                                                                ;PAGE TRAPPED BEFORE COMPLETING
022136  022702  043414                  CMP     #DESTAD+40002,R2
022142  001401                          BEQ     .+4
022144  104006                          HLT                     ;THE AUTOINCREMENT IN THE INSTRUCTION
                                                                ;REFERENCING THE RRWTW PAGE
                                                                ;FAILED TO COMPLETE
022146  016777  160664  160660  DONE60: MOV     KTSTA,@KTVEC    ;CHANGE KT11-C FAULT RETURN TO
022154  005077  160656                  CLR     @KTSTA          ;CAUSE A HALT ON AN UNEXPECTED TRAP
022160  005077  160640                  CLR     @SR0
022164  005037  177776                  CLR     @#PS

022170  104400                          SCOPE

022172  004767  001076                  JSR     %7,BELL

022176  013701  000042                  MOV     @#42,R1         ;MONITOR HOOK
022202  001405                          BEQ     END
022204  000005                          RESET
022206  004711                  LOGIC:  JSR     %7,@R1
022210  000240                          NOP
022212  000240                          NOP
022214  000240                          NOP

022216  000167  161172          END:    JMP     START

                                        ;SUBROUTINE TO CLEAR ALL KT11-C REGISTERS (EXCEPT SR1,SR2,SR3)
022222  005077  160576          CLRALL: CLR     @SR0
022226  005000                          CLR     R0
022230  012701  000140                  MOV     #96.,R1         ;COUNT OF REGISTERS TO BE CLEARED
022234  005070  003040          CLRLP:  CLR     @ADRTAB(R0)     ;CLEAR REGISTERS THRU ADDRESS TABLE
022240  005720                          TST     (R0)+           ;MOVE POINTER
022242  077104                          SOB     R1,CLRLP        ;LOOP TILL DONE
022244  000207                          RTS     %7

                                        ;SUBROUTINE TO MAKE ALL PAGES RW, BANK 0, 4K, UP
022246  005077  160552          RWALL:  CLR     @SR0
022252  012701  003040                  MOV     #ADRTAB,R1
022256  012700  000020          RWL1:   MOV     #20,R0
022262  005071  000040          RWL2:   CLR     @40(R1)
022266  012731  077406                  MOV     #77406,@(R1)+
022272  077005                          SOB     R0,RWL2
022274  062701  000040                  ADD     #40,R1
022300  020127  003336                  CMP     R1,#ADREND
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022304  003764                          BLE     RWL1
022306  000207                          RTS     %7

                                ;SUBROUTINE TO SET ALL PAGES RW EXCEPT KERNEL PAGE 1
                                ;KERNEL PAGE 1 IS SET TO DESIRED KEY
                                ;KEY IS PASSED VIA THE STACK
                                ;ALL PAGES ARE MAPPED TO BANK 0 EXCEPT KERNEL PAGE 7, WHICH IS MAPPED TO
                                ;THE EXTERNAL BANK
022310  004767  177732          SETUP:  JSR     %7,RWALL        ;INITIALLY MAP ALL PAGES RW, BANK 0
022314  012777  077400  160720          MOV     #77400,@KIPDR1  ;MAKE KERNEL PAGE ONE 4K, UP
022322  012777  077400  160732          MOV     #77400,@KDPDR1
022330  056677  000002  160704          BIS     2(SP),@KIPDR1   ;SET TO DESIRED KEY
022336  056677  000002  160716          BIS     2(SP),@KDPDR1
022344  012777  007600  160744          MOV     #7600,@KIPAR7   ;MAP KERNEL PAGE 7 EXTERNAL
022352  012777  007600  160756          MOV     #7600,@KDPAR7
022360  000207                          RTS     %7

                                ;ROUTINE TO LOOP THRU A SINGLE INSTRUCTION TEST
                                ;LOAD THE STARTING ADDRESS OF THE TEST
                                ;YOU WISH TO RUN (THE ADDRESS OF THE TESTXX
                                ;TAG) AT THE 1ST HALT, SET SWITCH REGISTER
                                ;OPTIONS AT THE 2ND HALT.
                                ;NOTE THAT SW11 MUST BE DOWN AFTER THE 2ND HALT
022362  005037  177776          TESTX:  CLR     @#PS
022366  012706  001000                  MOV     #KSTACK,SP
022372  012737  040000  177776          MOV     #40000,@#PS     ;SETUP SUPERVISOR STACK POINTER
022400  012706  002000                  MOV     #SSTACK,SP
022404  012737  140000  177776          MOV     #140000,@#PS    ;SETUP USER STACK POINTER
022412  012706  003000                  MOV     #USTACK,SP
022416  005037  177776                  CLR     @#PS
022422  000000                          HALT                    ;WAIT FOR STARTING ADDRESS
022424  016767  155140  000036          MOV     SR,RETRNX       ;LOAD STARTING ADDRESS IN RETRNX
022432  062767  000002  000030          ADD     #2,RETRNX       ;ADD 2 TO POINT TO INSTRUCTION AFTER
022440  000000                          HALT                    ;SET SR OPTIONS
022442  005067  000150                  CLR     SCOPEF          ;KEEP COUNT AT ZERO
022446  012767  022460  000144          MOV     #XLOOP,RETURN   ;LOAD SCOPE LOOP RETURN POINTER
022454  000177  000010                  JMP     @RETRNX         ;JUMP TO TEST
022460  005067  000132          XLOOP:  CLR     SCOPEF          ;KEEP COUNT AT ZERO
022464  000177  000000                  JMP     @RETRNX         ;JUMP TO TEST
022470  000000                  RETRNX: 0

                                ;SCOPE AND/OR ITERATION LOOP FOR EACH TEST 4000 TIMES
022472  032737  040000  177570  SCOPEC: BIT     #40000,@#SR     ;TEST SR FOR SCOPE
022500  001015                          BNE     SCOPEB          ;YES,SCOPE
022502  032737  004000  177570          BIT     #4000,@#SR      ;NO-TEST FOR ITERATION
022510  001025                          BNE     SCOPEG          ;INHIBIT ITERATION
022512  026767  000100  000074          CMP     SCOPEF, ICOUNT  ;COMPARE CURRENT COUNT TO MAX NUMBER
022520  100021                          BPL     SCOPEG          ;EXIT-DONE
022522  005267  000070                  INC     SCOPEF          ;INCREMENT COUNT
022526  012737  000340  177776          MOV     #340,@#PS       ;PREVENT TRAPPING WHILE MOVING STACK
022534  022606                  SCOPEB: CMP     (6)+,%6         ;REPOSITION STACK
022536  012637  177776                  MOV     (6)+,@#PS       ;RESTORE PREVIOUS PROCESSOR STATUS
022542  032737  000400  177570          BIT     #400,@#SR               ;TEST FOR LOAD MICROBREAK REGISTER
022550  001403                          BEQ     .+10
022552  113777  177570  160620          MOVB    @#SR,@UBRK              ;LOAD MICROBREAK REGISTER IF SW08 IS SET
022560  000177  000034                  JMP     @RETURN         ;REPEAT TEST
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022564  005067  000026          SCOPEG: CLR     SCOPEF          ;CLEAR COUNT
022570  011667  000024                  MOV     @%6,RETURN      ;SAVE SCOPE RETURN POINTER
022574  032737  000400  177570          BIT     #400,@#SR       ;TEST FOR LOAD MICROBREAK REGISTER
022602  001403                          BEQ     .+10
022604  113777  177570  160566          MOVB    @#SR,@UBRK      ;LOAD MICROBREAK REGISTER IF SW08 IS SET
022612  000002                          RTI                     ;RETURN INLINE-NEXT TEST
022614  004000                  ICOUNT:4000                     ;ITERATION COUNT
022616  000000                  SCOPEF: 0                       ;COUNT LOCATION FOR ITERATION LOOP
022620  000000                  RETURN: 0                       ;ADDRESS OF LAST TEST


                                ;ENTERED WITH SYSTEM TRAP CALL (HLT)
                                ;PRINT OUT THE ERROR PC+2 AND STATUS REGISTER
022622  012767  000340  155146 PRINT:  MOV     #340,PS         ;SET PRIORITY TO 7
022630  036727  154734  020000          BIT     SR,#20000       ;TEST FOR INHIBIT PRINT OUT
022636  001401                          BEQ     .+4             ;BRANCH TO PRINT
022640  000432                          BR      CK              ;INHIBIT, CHECK FOR HALT
022642  012667  000100                  MOV     (6)+,SAVPC      ;PC OF FAILING ROUTINE
022646  012667  000076                  MOV     (6)+,SAVPSR     ;PSR OF ERROR CONDITION
022652  024646                          CMP     -(6),-(6)       ;RESTORE STACK
022654  012767  000200  155114          MOV     #200,PS
022662  004767  000424                  JSR     %7,CRLF         ;OUTPUT CARRIAGE RETURN AND LINE FEED
022666  016767  000054  000322          MOV     SAVPC,PTEMP1    ;LOAD WITH FAILING PC+2
022674  004767  000104                  JSR     %7,PROCT        ;PRINT FAILING PC+2
022700  105777  160106                  TSTB    @TCSR           ;WAIT FOR TTY READY
022704  100375                          BPL     .-4
022706  012777  000240  160100          MOV     #240,@TDBR      ;OUTPUT A SPACE
022714  016767  000030  000274          MOV     SAVPSR,PTEMP1   ;LOAD PROCESSOR STATUS
022722  004767  000056                  JSR     %7,PROCT        ;PRINT PROCESSOR STATUS
022726  005767  154636          CK:     TST     SR              ;CHECK SR FOR HALT SWITCH
022732  100001                          BPL     .+4             ;BRANCH IF NOT SET
022734  000000                          HALT                    ;HALT ON ERROR UP
022736  000002                          RTI                     ;RETURN TO MAIN LINE
022740  000000                  SAVR2:  0
022742  000000                  SAVR3:  0
022744  000000                  SAVR4:  0
022746  000000                  SAVPC:  0
022750  000000                  SAVPSR: 0

                                ;SUBROUTINE TO PRINT OUT OCTAL NUMBER
                                ;PRSHRT DELETES LEADING ZEROS
                                ;PROCT PRINTS OUT 6 OCTAL DIGITS
022752  012767  000001  000232 PRSHRT: MOV     #1,PRSFLG       ;SET FLAG TO INDICATE SHORT PRINTOUT
022760  005767  000232          TST     PTEMP1          ;CHECK FOR ZERO
022764  001011                  BNE     PROCT+4         ;BRANCH IF NOT ZERO
022766  105777  160020          TSTB    @TCSR           ;WAIT FOR TTY READY
022772  100375                  BPL     .-4
022774  012777  000260  160012  MOV     #260,@TDBR      ;OUTPUT A SINGLE ZERO
023002  000207                  RTS     %7              ;RETURN
023004  005067  000202  PROCT:  CLR     PRSFLG          ;CLEAR FLAG TO INDICATE FULL PRINTOUT
023010  005067  000206          CLR     PTEMP3          ;CLEAR R4 FOR COUNTING CHARACTERS OUTPUT
023014  005067  000174          CLR     PRFLG           ;INITIALIZE CARRY FLAG FOR ROTATES
023020  012767  000260  000172  MOV     #260,PTEMP2     ;SETUP R3
023026  005767  000164          TST     PTEMP1          ;CHECK BIT 15 OF NUMBER
023032  100002                  BPL     .+6             ;BRANCH IF ZERO
023034  005267  000160          INC     PTEMP2          ;INCREMENT R3 IF ONE
```

```
023040  006167  000152                  ROL     PTEMP1          ;ROTATE LEFT MOST OCTAL TO RIGHT END
023044  006167  000146                  ROL     PTEMP1
023050  005567  000140                  ADC     PRFLG           ;STORE CARRY
023054  005767  000132          P.CK:   TST     PRSFLG          ;CHECK FOR SHORT PRINTOUT
023060  001404                          BEQ     P.WAIT          ;BRANCH IF NOT SET
023062  026727  000132  000260          CMP     PTEMP2,#260     ;CHECK FOR ZERO IF SET
023070  001410                          BEQ     P.CONT          ;IF SET, GO TO NEXT CHARACTER
023072  105777  157714          P.WAIT: TSTB    @TCSR           ;WAIT FOR TTY READY
023076  100375                          BPL     P.WAIT
023100  016777  000114  157706          MOV     PTEMP2,@TDBR    ;OUTPUT NEXT CHARACTER
023106  005067  000100                  CLR     PRSFLG          ;PRINT REST OF NUMBER AFTER A NON-ZERO DIGIT
023112  005267  000104          P.CONT: INC     PTEMP3          ;COUNT
023116  026727  000100  000006          CMP     PTEMP3,#6       ;CHECK FOR DONE
023124  001001                          BNE     P.CNT1          ;BRANCH IF NOT DONE
023126  000207                          RTS     %7
023130  000241          P.CNT1: CLC                             ;CLEAR CARRY
023132  005767  000056                  TST     PRFLG           ;CHECK FOR PREVIOUS CARRY
023136  001403                          BEQ     .+10            ;BRANCH IF PREVIOUSLY ZERO
023140  005067  000050                  CLR     PRFLG           ;INITIALIZE FLAG
023144  000261                          SEC                     ;SET CARRY
023146  006167  000044                  ROL     PTEMP1          ;ROTATE NEXT CHARACTER INTO RIGHT END OF REGISTER
023152  006167  000040                  ROL     PTEMP1
023156  006167  000034                  ROL     PTEMP1
023162  005567  000026                  ADC     PRFLG           ;STORE CARRY
023166  016767  000024  000024          MOV     PTEMP1,PTEMP2   ;LOAD DATA INTO R3
023174  042767  177770  000016          BIC     #177770,PTEMP2  ;CLEAR ALL BUT LOWEST OCTAL DIGIT
023202  052767  000260  000010          BIS     #260,PTEMP2     ;SET TO ASCII EQUIVALENT
023210  000721                          BR      P.CK            ;LOOP
023212  000000          PRSFLG: 0
023214  000000          PRFLG:  0
023216  000000          PTEMP1: 0                               ;CONTAINS VALUE TO BE OUTPUT
023220  000000          PTEMP2: 0                               ;SCRATCH
023222  000000          PTEMP3: 0                               ;USED TO COUNT CHARACTERS OUTPUT

                        ;EMT HANDLER
                        ;FIRST 3 CALLS LEFT OPEN IN TABLE FOR EASY PATCHES
023224  011667  000032  EMTSRV: MOV     @SP,EPC         ;GET CALL
023230  162767  000002  000024          SUB     #2,EPC
023236  017767  000020  000016          MOV     @EPC,EPC
023244  105067  000013                  CLRB    EPC+1           ;SAVE OFFSET ONLY
023250  062767  023264  000004          ADD     #EMTAB,EPC      ;POINT TO TABLE OF ADDRESSES
023256  017707  000000                  MOV     @EPC,PC         ;JUMP TO DESIRED ROUTINE
023262  000000          EPC:    0
        000000                  PATCH1=0                        ;SUBSTITUTE 104000 WHERE 1ST PATCH IS NEEDED
        000000                  PATCH2=0                        ;104002 FOR 2ND PATCH
        000000                  PATCH3=0                        ;104004 FOR 3RD PATCH
023264  000000          EMTAB:  PATCH1                          ;LOAD ADDRESS OF 1ST PATCH HERE
023266  000000                  PATCH2                          ;LOAD ADDRESS OF 2ND PATCH HERE
023270  000000                  PATCH3                          ;LOAD ADDRESS OF 3RD PATCH HERE
023272  022622                  PRINT


                        ;BELL ON PASS COMPLETE
023274  105777  157512  BELL:   TSTB    @TCSR
023300  100375                  BPL     .-4
023302  012777  000207  157504  MOV     #207,@TDBR
```

```
023310  000207                          RTS     %7

                                ;SUBROUTINE TO OUTPUT CARRIAGE RETURN AND LINEFEED
023312  105777  157474         CRLF:   TSTB    @TCSR           ;WAIT FOR TTY READY
023316  100375                  BPL     .-4
023320  012777  000215  157466         MOV     #215,@TDBR      ;ROUTPUT CARRIAGE RETURN
023326  105777  157460                 TSTB    @TCSR           ;WAIT FOR TTY READY
023332  100375                  BPL     .-4
023334  012777  000212  157452         MOV     #212,@TDBR      ;OUTPUT LINEFEED
023342  000207                  RTS     %7              ;RETURN
        000001                  .END
```

D06

DCkTCA CROSS REFERENCE TABLE -- USER SYMBOLS

```
ADREND= 003336            399#   3420
ADRTAB  003040            302#   3407*   3414
AD10    005616            892#    908
AD13    006522           1062#   1078
AD14    006750           1121#   1137
AD15    007174           1181#   1197
AD16    007422           1241#   1257
AD17    007650           1302#   1318
AD20    010072           1362#   1378
AD21    010314           1428#   1445
AD22    010546           1490#   1505
AD23    010774           1549#   1565
AD24    011230           1610#   1626
AD25    011462           1672#   1688
AD26    011716           1733#   1749
AD27    012152           1795#   1811
AD3     004246            585#    601
AD30    012402           1856#   1872
AD4     004474            646#    662
AD5     004720            709#    725
AD6     005146            770#    786
AD7     005374            832#    848
BELL    023274           3391    3586#
CK      022726           3493    3506#
CLRALL  022222           3404#
CLRLP   022234           3407#   3409
CMPDK1  003606            458     462#
CRLF    023312           3498    3592#
DESTAD  003412            420#    453*    454     514*    519     580*    582     616     641*    643     678     704*    706
                          740     765*    767     801     827*    829     862     887*    889     922     947*    948     1003*
                         1004    1057*   1059    1091    1116*   1118    1150    1176*   1178    1211    1236*   1238    1271
                         1297*   1299    1332    1357*   1359    1392    1424*   1425    1483*   1487    1544*   1546    1582
                         1605*   1607    1643    1667*   1669    1705    1728*   1730    1766    1790*   1792    1828    1851*
                         1853    1889    1926*   1927    1984*   1985    2042*   2043    2071    2100*   2101    2129    2158*
                         2159    2187    2216*   2217    2245    2274*   2275    2303    2332*   2333    2361    2389*   2390
                         2451*   2456    2516*   2518    2547    2575*   2577    2609    2634*   2635    2666    2696*   2701
                         2736    2740    2764*   2765    2796    2826*   2827    2862    2866    2892*   2893    2953*   2954
                         3011*   3013    3043    3076*   3078    3110    3140*   3141    3171    3205*   3206    3241    3245
                         3273*   3274    3305    3339*   3340    3375    3379
DONE1   003710            461     488     493#
DONE10  005730            895     926#
DONE11  006160            955     978     982#
DONE12  006412           1011    1033    1036#
DONE13  006640           1065    1095#
DONE14  007064           1124    1154#
DONE15  007312           1184    1215#
DONE16  007540           1244    1275#
DONE17  007762           1305    1336#
DONE2   004136            525     559#
DONE20  010204           1365    1396#
DONE21  010440           1431    1464#
DONE22  010672           1493    1525#
DONE23  011126           1552    1586#
DONE24  011360           1613    1647#
DONE25  011614           1675    1709#
DONE26  012050           1736    1770#
```

DCKTCA CROSS REFERENCE TABLE -- USER SYMBOLS

```
DONE27  012300            1798    1832#
DONE3   004364             588     620#
DONE30  012530            1659    1893#
DONE31  013036            1934    1959    1963#
DONE32  013270            1992    2017    2021#
DONE33  013516            2074    2078#
DONE34  013746            2132    2136#
DONE35  014172            2190    2194#
DONE36  014422            2248    2252#
DONE37  014646            2306    2310#
DONE4   004610             649     682#
DONE40  015074            2364    2368#
DONE41  015324            2398    2425    2430#
DONE42  015552            2462    2496#
DONE43  016000            2551    2554#
DONE44  016226            2583    2613#
DONE45  016454            2670    2675#
DONE46  016714            2708    2743#
DONE47  017140            2800    2205#
DONE5   005036             712     744#
DONE50  017376            2834    2871#
DONE51  017626            2900    2925    2929#
DONE52  020102            2983    2986#
DONE53  020362            3047    3050#
DONE54  020640            3085    3114#
DONE55  021116            3175    3180#
DONE56  021404            3213    3248#
DONE57  021660            3309    3314#
DONE6   005264             773     805#
DONE60  022146            3347    3384#
DONE7   005506             835     866#
EMTAB   023264            3573    3579#
EMTSPV  023224             270    3569#
END     022216            3394    3401#
EPC     023262            3569*   3570*   3571*   3572*   3573*   3574    3575#
HLT   = 104006             261#    460     466     472     476     480     485     490     524     531     537     541     545
                           550     555     587     593     598     603     608     613     618     648     654     659     664
                           669     674     680     711     717     722     727     732     737     742     772     778     783
                           788     793     798     803     834     840     845     850     855     859     864     894     900
                           905     910     915     919     924     954     960     965     969     973     977     980    1010
                          1016    1021    1025    1029    1032    1035    1064    1070    1075    1080    1085    1089    1093
                          1123    1129    1134    1139    1144    1148    1152    1183    1189    1194    1199    1204    1208
                          1213    1243    1249    1254    1259    1264    1268    1273    1304    1310    1315    1320    1325
                          1329    1334    1364    1370    1375    1380    1385    1389    1394    1430    1436    1441    1447
                          1453    1459    1463    1492    1499    1503    1507    1513    1519    1523    1551    1557    1562
                          1567    1574    1580    1584    1612    1618    1623    1628    1635    1641    1645    1674    1680
                          1685    1690    1697    1703    1707    1735    1741    1746    1751    1758    1764    1768    1797
                          1803    1808    1813    1820    1826    1830    1858    1864    1869    1874    1881    1887    1891
                          1933    1939    1945    1949    1953    1957    1961    1991    1997    2003    2007    2011    2015
                          2019    2051    2057    2061    2065    2069    2073    2076    2109    2115    2119    2123    2127
                          2131    2134    2167    2173    2177    2181    2185    2189    2192    2225    2231    2235    2239
                          2243    2247    2250    2283    2289    2293    2297    2301    2305    2308    2341    2347    2351
                          2355    2359    2363    2366    2397    2403    2409    2413    2417    2422    2427    2461    2468
                          2474    2478    2482    2487    2492    2526    2532    2536    2539    2544    2549    2553    2582
                          2588    2594    2598    2601    2606    2611    2644    2650    2654    2658    2663    2668    2672
                          2707    2714    2720    2724    2728    2733    2738    2742    2774    2780    2784    2788    2793
```

DCKTCA CROSS REFERENCE TABLE -- USER SYMBOLS

H06

DCKTCA CROSS REFERENCE TABLE -- USER SYMBOLS

RET1	003700	451	489#										
RET10	005630	885	896#										
RET11	006150	945	979#										
RET12	006402	1001	1034#										
RET13	006540	1055	1066#										
RET14	006764	1114	1125#										
RET15	007210	1174	1185#										
RET16	007436	1234	1245#										
RET17	007662	1295	1306#										
RET2	004036	512	527#										
RET20	010104	1355	1366#										
RET21	010326	1421	1432#										
RET22	010560	1481	1495#										
RET23	011012	1542	1553#										
RET24	011244	1603	1614#										
RET25	011476	1665	1676#										
RET26	011732	1726	1737#										
RET27	012164	1788	1799#										
RET3	004264	578	589#										
RET30	012414	1849	1860#										
RET31	013026	1924	1960#										
RET32	013260	1982	2018#										
RET33	013506	2040	2075#										
RET34	013736	2098	2133#										
RET35	014162	2156	2191#										
RET36	014412	2214	2249#										
RET37	014636	2272	2307#										
RET4	004510	639	650#										
RET40	015064	2330	2365#										
RET41	015314	2387	2426#										
RET42	015452	2449	2464#										
RET43	015770	2514	2552#										
RET44	016124	2573	2584#										
RET45	016444	2632	2671#										
RET46	016604	2694	2710#										
RET47	017130	2762	2801#										
RET5	004734	702	713#										
RET50	017264	2824	2836#										
RET51	017616	2890	2926#										
RET52	020072	2951	2984#										
RET53	020352	3009	3048#										
RET54	020536	3074	3086#										
RET55	021106	3138	3176#										
RET56	021274	3203	3215#										
RET57	021650	3271	3310#										
RET6	005162	763	774#										
RET60	022034	3337	3349#										
RET7	005406	825	836#										
RWALL	022246	3413#	3429										
RWL1	022256	3415#	3421										
RWL2	022262	3416#	3418										
R0	=%000000	248#	2333#	2336#	3405#	3407#	3408	3415#	3418#				
R1	=%000001	249#	454#	457	519#	522	582#	585#	650#	652	713#	715	771#	776
		836#	838	896#	898	948#	951	1004#	1007	1059#	1062#	1125#	1127	1185#
		1187	1245#	1247	1306#	1308	1366#	1368	1425#	1428	1487#	1490	1546#	1549#
		1614#	1616	1676#	1678	1737#	1739	1799#	1801	1860#	1862	1902#	1903#	1904

DCKTCA CROSS REFERENCE TABLE -- USER SYMBOLS

DCKTCA CROSS REFEPENCE TABLE -- USER SYMBOLS

```
SIPAR1  003202            352#
SIPAR2  003204            353#
SIPAR3  003206            354#
SIPAR4  003210            355#
SIPAR5  003212            356#
SIPAR6  003214            357#
SIPAR7  003216            358#
SIPDR0  003140            335#    409
SIPDR1  003142            336#
SIPDR2  003144            337#
SIPDR3  003146            338#
SIPDR4  003150            339#
SIPDR5  003152            340#
SIPDR6  003154            341#
SIPDR7  003156            342#
SP     =%000006           256#    426*    428*    430*    444*    446*    450     505*    507*    511     571*    573*    577
                          632*    634*    638     695*    697*    701     756*    758*    762     818*    820*    824     878*
                          880*    884     938*    940*    944     994*    996*    1000    1048*   1050*   1054    1107*   1109*
                         1113    1167*   1169*   1173    1227*   1229*   1233    1288*   1290*   1294    1348*   1350*   1354
                         1416*   1476*   1537*   1598*   1660*   1721*   1783*   1844*   1917*   1919*   1923    1975*   1977*
                         1981    2033*   2035*   2039    2091*   2093*   2097    2149*   2151*   2155    2207*   2209*   2213
                         2265*   2267*   2271    2323*   2325*   2329    2380*   2382*   2386    2442*   2444*   2448    2508*
                         2510*   2566*   2568*   2572    2625*   2627*   2631    2687*   2689*   2693    2755*   2757*   2761
                         2817*   2819*   2823    2883*   2885*   2889    2941*   2943*   2946    2999*   3001*   3004    3062*
                         3064*   3067    3126*   3128*   3131    3192*   3194*   3197    3260*   3262*   3265    3326*   3328*
                         3331    3432    3433    3445*   3447*   3449*   3569
SR     = 177570            258#    442*    503*    569*    630*    693*    754*    816*    876*    936*    992*    1046*   1105*
                         1165*   1225*   1286*   1346*   1414*   1474*   1535*   1596*   1658*   1719*   1781*   1842*   1915*
                         1973*   2031*   2089*   2147*   2205*   2263*   2321*   2378*   2440*   2506*   2564*   2623*   2685*
                         2753*   2815*   2881*   2939*   2997*   3060*   3124*   3190*   3258*   3324*   3452    3463    3465
                         3473    3475    3479    3481    3491    3506
SR0     003024            296#    445*    456*    459*    462     463*    489*    495*    506*    521*    523*    527     528*
                          561*    572*    584*    586*    589     590*    622*    633*    645*    647*    650     651*    684*
                          696*    708*    710*    713     714*    746*    757*    769*    771*    774     775*    807*    819*
                          831*    833*    836     837*    868*    879*    891*    893*    896     897*    928*    939*    950*
                          953*    956     957*    979*    984*    995*   1006*   1009*   1012    1013*   1034*   1038*   1049*
                         1061*   1063*   1066    1067*   1097*   1108*   1120*   1122*   1125    1126*   1156*   1168*   1180*
                         1182*   1185    1186*   1217*   1228*   1240*   1242*   1245    1246*   1277*   1289*   1301*   1303*
                         1306    1307*   1338*   1349*   1361*   1363*   1366    1367*   1398*   1417*   1427*   1429*   1432
                         1433*   1466*   1477*   1489*   1491*   1495    1496*   1527*   1538*   1548*   1550*   1553    1554*
                         1588*   1599*   1609*   1611*   1614    1615*   1649*   1661*   1671*   1673*   1676    1677*   1711*
                         1722*   1732*   1734*   1737    1738*   1772*   1784*   1794*   1796*   1799    1800*   1834*   1845*
                         1855*   1857*   1860    1861*   1895*   1918*   1929*   1932*   1935    1936*   1960*   1965*   1976*
                         1987*   1990*   1993    1994*   2018*   2023*   2034*   2045*   2047    2048*   2075*   2080*   2092*
                         2103*   2105    2106*   2133*   2138*   2150*   2161*   2163    2164*   2191*   2196*   2208*   2219*
                         2221    2222*   2249*   2254*   2266*   2277*   2279    2280*   2307*   2312*   2324*   2335*   2337
                         2338*   2365*   2370*   2381*   2392*   2396*   2399    2400*   2426*   2432*   2443*   2458*   2460*
                         2464    2465*   2498*   2509*   2520*   2522    2523*   2552*   2556*   2567*   2579*   2581*   2584
                         2585*   2615*   2626*   2637*   2640    2641*   2671*   2677*   2688*   2703*   2706*   2710    2711*
                         2745*   2756*   2767*   2770    2771*   2801*   2807*   2818*   2829*   2832*   2836    2837*   2873*
                         2884*   2895*   2898*   2901    2902*   2926*   2931*   2942*   2956*   2960    2961*   2984*   2988*
                         3000*   3015*   3018    3019*   3048*   3052*   3063*   3080*   3083*   3086    3087*   3116*   3127*
                         3143*   3146    3147*   3176*   3182*   3193*   3208*   3211*   3215    3216*   3250*   3261*   3276*
                         3279    3280*   3310*   3316*   3327*   3342*   3345*   3349    3350*   3386*   3404*   3413*
SP'JH   003372            414#
SR1     003026            297#    470     535     596     657     720     781     843     903     963     1019    1073    1132
```

```
TEST42  015346            2439#
TEST43  015574            2505#
TEST44  016022            2563#
TEST45  016250            2622#
TEST46  016476            2684#
TEST47  016736            2752#
TEST5   004632             692#
TEST50  017162            2814#
TEST51  017420            2880#
TEST52  017650            2938#
TEST53  020124            2996#
TEST54  020404            3059#
TEST55  020662            3123#
TEST56  021140            3189#
TEST57  021426            3257#
TEST6   005060             753#
TEST60  021702            3323#
TEST7   005306             815#
UBRK    003400             417#   3475*   3481*
UDPAR0  003120             327#
UDPAR1  003122             328#
UDPAR2  003124             329#
UDPAR3  003126             330#
UDPAR4  003130             331#
UDPAR5  003132             332#
UDPAR6  003134             333#
UDPAR7  003136             334#
UDPDR0  003060             311#
UDPDR1  003062             312#
UDPDR2  003064             313#
UDPDR3  003066             314#
UDPDR4  003070             315#
UDPDR5  003072             316#
UDPDR6  003074             317#
UDPDR7  003076             318#
UIPAR0  003100             319#
UIPAR1  003102             320#
UIPAR2  003104             321#
UIPAR3  003106             322#
UIPAR4  003110             323#
UIPAR5  003112             324#
UIPAR6  003114             325#
UIPAR7  003116             326#
UIPDR0  003040             303#    411
UIPDR1  003042             304#
UIPDR2  003044             305#
UIPDR3  003046             306#
UIPDR4  003050             307#
UIPDR5  003052             308#
UIPDR6  003054             309#
UIPDR7  003056             310#
USTACK  003000             288#    430    3449
XLOOP   022460            3456    3458#
.     = 023344             267#    268#   272#   277#   279#   283#   285#   287#   399    465    471    474    475
                           479     484    530    536    539    540    544    549    554    592    597    602    607
                           612     617    653    658    663    668    673    679    716    721    726    731    736
```

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DCKTCA CROSS REFERENCE TABLE -- USER SYMBOLS

741	777	782	787	792	797	802	839	844	849	854	858	863
899	904	909	914	918	923	953	964	967	968	972	976	1015
1020	1023	1024	1028	1031	1069	1074	1079	1084	1088	1092	1128	1133
1138	1143	1147	1151	1188	1193	1198	1203	1207	1212	1248	1253	1258
1263	1267	1272	1309	1314	1319	1324	1328	1333	1369	1374	1379	1384
1388	1393	1435	1440	1446	1452	1458	1462	1498	1502	1506	1512	1518
1522	1556	1561	1566	1573	1579	1583	1617	1622	1627	1634	1640	1644
1679	1684	1689	1696	1702	1706	1740	1745	1750	1757	1763	1767	1802
1807	1812	1819	1825	1829	1863	1868	1873	1880	1886	1890	1938	1944
1947	1948	1952	1956	1996	2002	2005	2006	2010	2014	2050	2056	2059
2060	2064	2068	2072	2108	2114	2117	2118	2122	2126	2130	2166	2172
2175	2176	2180	2184	2188	2224	2230	2233	2234	2238	2242	2246	2282
2288	2291	2292	2296	2300	2304	2340	2346	2349	2350	2354	2358	2362
2402	2408	2411	2412	2416	2421	2467	2473	2476	2477	2481	2486	2491
2525	2531	2534	2535	2538	2543	2548	2587	2593	2596	2597	2600	2605
2610	2643	2649	2652	2653	2657	2662	2667	2713	2719	2722	2723	2727
2732	2737	2741	2773	2779	2782	2783	2787	2792	2797	2839	2845	2848
2849	2853	2858	2863	2867	2904	2910	2913	2914	2918	2922	2958	2963
2968	2971	2972	2976	2980	3021	3027	3030	3031	3034	3039	3044	3089
3095	3098	3099	3102	3107	3111	3149	3155	3158	3159	3163	3168	3172
3218	3224	3227	3228	3232	3237	3242	3246	3282	3288	3291	3292	3296
3301	3306	3352	3358	3361	3362	3366	3371	3376	3380	3474	3480	3492
3502	3507	3523	3531	3550	3587	3593	3596					

```
COMMEN      1#
DATIP1    687#    688     749
DATIP2    810#    811     871
DATIP3   1159#   1160    1220
DATIP4   1280#   1281    1341
DATIP5   1652#   1653    1714
DATIP6   1775#   1776    1837
ENDCOM      1#
ESCAPE      1#
GETPRI      1#
GETSWR      1#
MULT        1#
NEWTST      1#
POP         1#
PUSH        1#
REPORT      1#
SETPRI      1#
SETUP       1#
SKIP        1#
SLASH       1#
STARS       1#
SWRSU       1#
TESTNO    423#    442     503     569     630     693     754     816     876     936     992    1046    1105    1165    1225
         1286    1346    1414    1474    1535    1596    1658    1719    1781    1842    1915    1973    2031    2089    2147
         2205    2263    2321    2378    2440    2506    2564    2623    2685    2753    2815    2881    2939    2997    3060
         3124    3190    3258    3324
TYPBIN      1#
TYPDEC      1#
TYPNAM      1#
TYPNUM      1#
TYPOCS      1#
TYPOCT      1#
TYPTXT      1#
SSESCA      1#
SSNEWT      1#
SSSKIP      1#
.EQUAT      1#
.HEADE      1#
.KT11       1#
.SETUP      1#
.SWRHI      1#
.SACTI      1#
.SAPTB      1#
.SAPTH      1#
.SAPTY      1#
.SASTA      1#
.SCATC      1#
.SCMTA      1#
.SDB2D      1#
.SDB2O      1#
.SDIV       1#
.SEOP       1#
.SERRO      1#
.SEPRT      1#
.SMULT      1#
.SPOWE      1#
```

DCKTCA CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
ADC     3535    3556
ADD     2638    2704    3144    3209    3419    3453    3573
ASL     1903
BEQ      458     465     471     475     479     484     530     536     540     544     549     554     592     597     602
         607     612     617     653     658     663     668     673     679     716     721     726     731     736     741
         777     782     787     792     797     802     839     844     849     854     858     653     899     904     909
         914     918     923     952     959     964     968     972     976    1008    1015    1020    1024    1028    1031
        1069    1074    1079    1084    1088    1092    1128    1133    1138    1143    1147    1151    1188    1193    1198
        1203    1207    1212    1248    1253    1258    1263    1267    1272    1309    1314    1319    1324    1328    1333
        1369    1374    1379    1384    1388    1393    1435    1440    1446    1452    1458    1462    1498    1502    1506
        1512    1518    1522    1556    1561    1566    1573    1579    1583    1617    1622    1627    1634    1640    1644
        1679    1684    1689    1696    1702    1706    1740    1745    1750    1757    1763    1767    1802    1807    1812
        1819    1825    1829    1863    1868    1873    1880    1886    1890    1901    1931    1938    1944    1948    1952
        1956    1989    1996    2002    2006    2010    2014    2050    2056    2060    2064    2068    2072    2108    2114
        2118    2122    2126    2130    2166    2172    2176    2180    2184    2188    2224    2230    2234    2238    2242
        2246    2282    2288    2292    2296    2300    2304    2340    2346    2350    2354    2358    2362    2395    2402
        2408    2412    2416    2421    2467    2473    2477    2481    2486    2491    2525    2531    2535    2538    2543
        2548    2587    2593    2597    2600    2605    2610    2643    2649    2653    2657    2662    2667    2713    2719
        2723    2727    2732    2737    2741    2773    2779    2783    2787    2792    2797    2839    2845    2849    2853
        2858    2863    2867    2897    2904    2910    2914    2918    2922    2958    2963    2968    2972    2976    2980
        3021    3027    3031    3034    3039    3044    3089    3095    3099    3102    3107    3111    3149    3155    3159
        3163    3168    3172    3218    3224    3228    3232    3237    3242    3246    3282    3288    3292    3296    3301
        3306    3352    3358    3362    3366    3371    3376    3380    3394    3474    3480    3492    3537    3539    3550
BIC      489     586     710     714     771     775     979    1034    1063    1182    1186    1242    1246    1450    1456
        1510    1516    1550    1571    1577    1632    1638    1673    1677    1694    1700    1734    1738    1755    1761
        1817    1823    1878    1884    1960    2018    2075    2133    2191    2222    2249    2307    2365    2426    2552
        2671    2801    2926    2984    3048    3176    3310    3558
BIS      708     769     831     891    1180    1240    1301    1361    1671    1732    1794    1855    1987    3432    3433
        3559
BIT     3463    3465    3473    3479    3491
BLE     3421
BNE     3464    3466    3521    3546
BPL     3468    3502    3507    3523    3531    3541    3587    3593    3596
BR       461     488     525     588     649     712     773     835     895     955     978    1011    1033    1065    1124
        1184    1244    1305    1365    1431    1493    1552    1613    1675    1736    1798    1859    1934    1959    1992
        2017    2074    2132    2190    2248    2306    2364    2398    2425    2462    2551    2583    2670    2708    2800
        2834    2900    2925    2983    3047    3085    3175    3213    3309    3347    3493    3560
CLC     3548
CLR      425     431     434     443     445     452     494     495     496     504     506     513     515     560     561
         562     570     572     579     580     621     622     623     631     633     640     641     683     684     685
         694     696     703     704     745     746     747     755     757     764     765     806     807     808     817
         819     826     827     867     868     869     877     879     886     887     927     928     929     937     939
         946     983     984     985     993     995    1002    1037    1038    1039    1047    1049    1056    1057    1096
        1097    1098    1106    1108    1115    1116    1155    1156    1157    1166    1168    1175    1176    1216    1217
        1218    1226    1228    1235    1236    1276    1277    1278    1287    1289    1296    1297    1337    1338    1339
        1347    1349    1356    1357    1397    1398    1399    1411    1415    1417    1422    1423    1465    1466    1467
        1475    1477    1482    1484    1526    1527    1528    1536    1538    1543    1544    1587    1588    1589    1597
        1599    1604    1605    1648    1649    1650    1659    1661    1666    1667    1710    1711    1712    1720    1722
        1727    1728    1771    1772    1773    1782    1784    1789    1790    1833    1834    1835    1843    1845    1850
        1851    1894    1895    1896    1907    1916    1918    1925    1964    1965    1966    1974    1976    1983    2022
        2023    2024    2032    2034    2041    2042    2079    2080    2081    2090    2092    2099    2100    2137    2138
        2139    2148    2150    2157    2158    2195    2196    2197    2206    2208    2215    2216    2253    2254    2255
        2264    2266    2273    2274    2311    2312    2313    2322    2324    2331    2332    2369    2370    2371    2379
        2381    2388    2431    2432    2433    2441    2443    2450    2452    2497    2498    2499    2507    2509    2515
        2516    2555    2556    2557    2565    2567    2574    2575    2614    2615    2616    2624    2626    2633    2676
        2677    2678    2686    2688    2695    2697    2744    2745    2746    2754    2756    2763    2764    2806    2807
```

D07

DCKTCA CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
        2808  2816  2818  2825  2872  2873  2874  2882  2884  2891  2930  2931  2932  2940  2942
        2952  2987  2988  2989  2998  3000  3010  3011  3051  3052  3053  3061  3063  3075  3076
        3115  3116  3117  3125  3127  3139  3181  3182  3183  3191  3193  3204  3249  3250  3251
        3259  3261  3272  3273  3315  3316  3317  3325  3327  3338  3385  3386  3387  3404  3405
        3407  3413  3416  3444  3450  3455  3458  3477  3526  3527  3528  3543  3551
CLRB     523  1491  2164  2460  2706  2832  3211  3345  3572
CMP      457   464   470   474   478   483   529   535   539   543   548   553   591   596   601
         606   611   652   657   662   667   672   715   720   725   730   735   776   781   786
         791   796   838   843   848   853   857   898   903   908   913   917   951   958   963
         967   971   975  1007  1014  1019  1023  1027  1030  1068  1073  1078  1083  1087  1127
        1132  1137  1142  1146  1187  1192  1197  1202  1206  1247  1252  1257  1262  1265  1308
        1313  1318  1323  1327  1368  1373  1378  1383  1387  1434  1439  1445  1451  1457  1497
        1501  1505  1511  1517  1555  1560  1565  1572  1578  1616  1621  1626  1633  1639  1678
        1683  1688  1695  1701  1739  1744  1749  1756  1762  1801  1806  1811  1818  1824  1862
        1867  1872  1879  1885  1900  1930  1937  1943  1947  1951  1955  1988  1995  2001  2005
        2009  2013  2049  2055  2059  2063  2067  2071  2107  2113  2117  2121  2125  2129  2165
        2171  2175  2179  2183  2187  2223  2229  2233  2237  2241  2245  2281  2287  2291  2295
        2299  2303  2339  2345  2349  2353  2357  2361  2393  2401  2407  2411  2415  2420  2466
        2472  2476  2480  2485  2490  2524  2530  2534  2537  2542  2547  2586  2592  2596  2599
        2604  2609  2642  2648  2652  2656  2661  2712  2718  2722  2726  2731  2740  2772  2778
        2782  2786  2791  2796  2838  2844  2848  2852  2857  2862  2866  2896  2903  2909  2913
        2917  2921  2957  2962  2967  2971  2975  2979  3020  3026  3030  3033  3038  3043  3088
        3094  3098  3101  3106  3110  3148  3154  3158  3162  3167  3217  3223  3227  3231  3236
        3245  3281  3287  3291  3295  3300  3305  3351  3357  3361  3365  3370  3375  3379  3420
        3467  3471  3496  3538  3545
DEC      459   528   590   647   651   833   837   893   897   953  1009  1013  1067  1126  1303
        1307  1363  1367  1429  1496  1554  1615  1796  1800  1957  1861  1932  1990  2396  2465
        2523  2585  2711  2837  2898  2961  3019  3087  3216  3350
DECB     463   957  1122  1433  1611  1936  1994  2048  2106  2278  2280  2336  2338  2400  2581
        2641  2771  2902  3083  3147  3280
HALT     267  3451  3454  3508
INC      456   709   770   950  1181  1241  1427  1672  1733  1899  1929  2045  2161  2162  2220
        2277  2392  2637  2767  2895  3143  3276  3469  3532  3544
INCB     832   892  1302  1362  1795  1856  2768  2830  3277  3343
JMP      278   280  1906  3401  3457  3459  3476
JSR      447   508   574   635   698   759   821   881   941   997  1051  1110  1170  1230  1291
        1351  1418  1478  1539  1600  1662  1723  1785  1846  1920  1978  2036  2094  2152  2210
        2268  2326  2383  2445  2511  2569  2628  2690  2758  2820  2886  2944  3002  3065  3129
        3195  3263  3329  3391  3396  3429  3498  3500  3505
MOV      426   427   428   429   430   432   433   435   442   444   446   451   453   454   462
         493   503   505   507   512   514   519   521   522   527   559   569   571   573   578
         582   585   589   620   630   632   634   639   643   645   646   650   682   693   695
         697   702   706   713   744   754   756   758   763   767   774   805   816   818   820
         825   829   836   866   876   878   880   885   889   896   926   936   938   940   945
         947   948   956   982   992   994   996  1001  1003  1004  1006  1012  1036  1046  1048
        1050  1055  1059  1062  1066  1095  1105  1107  1109  1114  1118  1120  1121  1125  1154
        1165  1167  1169  1174  1178  1185  1215  1225  1227  1229  1234  1238  1245  1275  1286
        1288  1290  1295  1299  1306  1336  1346  1348  1350  1355  1359  1366  1396  1414  1416
        1421  1424  1425  1428  1432  1449  1455  1464  1474  1476  1481  1483  1487  1489  1490
        1495  1509  1515  1525  1535  1537  1542  1546  1549  1553  1570  1576  1586  1596  1598
        1603  1607  1609  1610  1614  1631  1637  1647  1658  1660  1665  1669  1676  1693  1699
        1709  1719  1721  1726  1730  1737  1754  1760  1770  1781  1783  1788  1792  1799  1816
        1822  1832  1842  1844  1849  1853  1860  1877  1883  1893  1902  1904  1905  1908  1915
        1917  1919  1924  1926  1927  1935  1963  1973  1975  1977  1982  1984  1985  1993  2021
        2031  2033  2035  2040  2043  2046  2047  2078  2089  2091  2093  2098  2101  2103  2104
        2105  2136  2147  2149  2151  2156  2159  2163  2194  2205  2207  2209  2214  2217  2219
```

E07

DCKTCA CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
             2221    2252    2263    2265    2267    2272    2275    2279    2310    2321    2323    2325    2330    2333    2335
             2337    2368    2378    2380    2382    2387    2389    2390    2393    2430    2440    2442    2444    2449    2451
             2456    2458    2459    2464    2496    2506    2508    2510    2514    2518    2521    2522    2554    2564    2566
             2568    2573    2577    2579    2580    2584    2613    2623    2625    2627    2632    2634    2635    2640    2675
             2685    2687    2689    2694    2696    2701    2703    2710    2743    2753    2755    2757    2762    2765    2770
             2805    2815    2817    2819    2824    2826    2827    2829    2836    2871    2881    2893    2885    2890    2892
             2893    2901    2929    2939    2941    2943    2947    2948    2949    2950    2951    2953    2954    2956    2960
             2986    2997    2999    3001    3005    3006    3007    3008    3009    3013    3016    3018    3050    3060    3062
             3064    3070    3071    3072    3073    3074    3078    3080    3081    3086    3114    3124    3126    3128    3134
             3135    3136    3137    3138    3140    3141    3146    3180    3190    3192    3194    3199    3200    3201    3202
             3203    3205    3206    3208    3215    3248    3258    3260    3262    3267    3268    3269    3270    3271    3274
             3279    3314    3324    3326    3328    3333    3334    3335    3336    3337    3339    3340    3342    3349    3384
             3393    3406    3414    3415    3417    3430    3431    3434    3435    3445    3446    3447    3448    3449    3452
             3456    3470    3472    3478    3490    3494    3495    3497    3499    3503    3504    3519    3524    3529    3542
             3557    3569    3571    3574    3588    3594    3597
MOVB          584    1061    1548    2520    3015    3475    3481
NOP          3397    3398    3399
RESET        3395
ROL          3533    3534    3553    3554    3555
RTI          3482    3509
RTS          3410    3422    3436    3525    3547    3589    3598
SEC          3552
SOB          3409    3418
SUB          3570
TRAP          246
TST           450     511     577     616     638     678     701     740     762     801     824     862     884     922     944
             1000    1054    1091    1113    1150    1173    1211    1233    1271    1294    1332    1354    1392    1461    1521
             1582    1643    1705    1766    1828    1889    1923    1981    2039    2097    2155    2213    2271    2329    2386
             2448    2572    2631    2666    2693    2736    2761    2823    2889    2946    3004    3067    3131    3171    3197
             3241    3265    3331    3408    3506    3520    3530    3536    3549
TSTB         3501    3522    3540    3586    3592    3595
.ABS            1
.ENABL          1
.END         3599
.LIST           1     267     423     442     503     569     630     693     754     816     876     936     992    1046    1105
             1165    1225    1286    1346    1414    1474    1535    1596    1658    1719    1781    1842    1915    1973    2031
             2089    2147    2205    2263    2321    2378    2440    2506    2564    2623    2685    2753    2815    2881    2939
             2997    3060    3124    3190    3258    3324
.MACR         423     687     810    1159    1280    1652    1775
.MACRO          1
.NLIST          1     267     423     442     503     569     630     693     754     816     876     936     992    1046    1105
             1165    1225    1286    1346    1414    1474    1535    1596    1658    1719    1781    1842    1915    1973    2031
             2089    2147    2205    2263    2321    2378    2440    2506    2564    2623    2685    2753    2815    2881    2939
             2997    3060    3124    3190    3258    3324
.REM            1
.REPT         267
.TITLE          1
.WORD         289
```

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

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*,DCKTCA.SEQ/SOL/CRF/PAGNUM/NL:TOC=SYSMAC.CO,DCKTCA
```

```
DCKTC-A MACY11 27(732)  01-OCT-76  13:43  PAGE 87
DCKTCA  CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

 RUN-TIME: 33 45 5 SECONDS
 RUN-TIME RATIO: 169/84=2.0
 CORE USED:  36K  (71 PAGES)
```

G07

Sampler runtime 13 Seconds, 57 KPS, 364 disk reads, 3 disk writes, 83 page